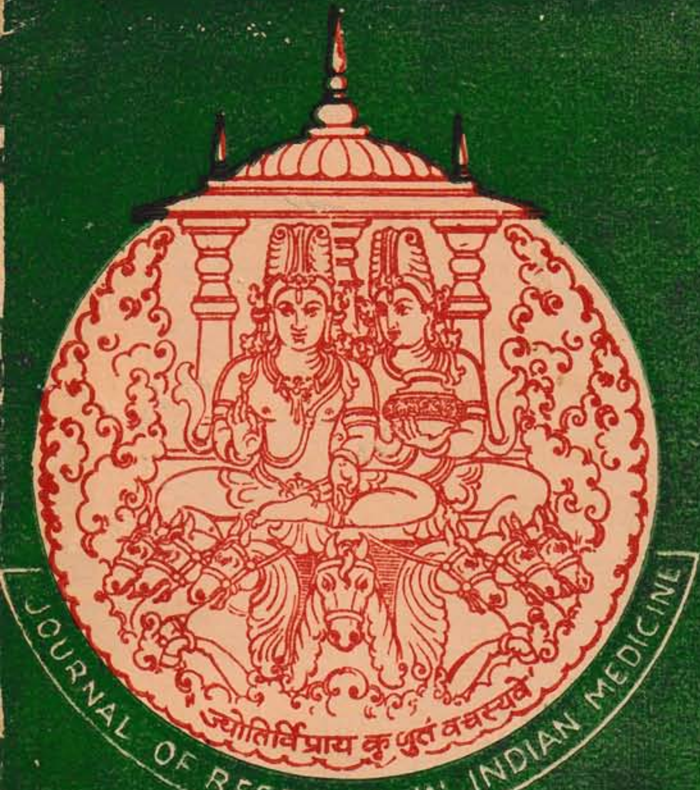
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JOURNAL OF RESEARCH IN INDIAN MEDICINE

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YOGA AND HOMOEOPATHY

Vol. XI, No. 1, March, 1976

Yoga and Homoeopathy

भारतीय चिकित्सा, योग एवं होमियोपैथी की अनुसंधान पत्रिका

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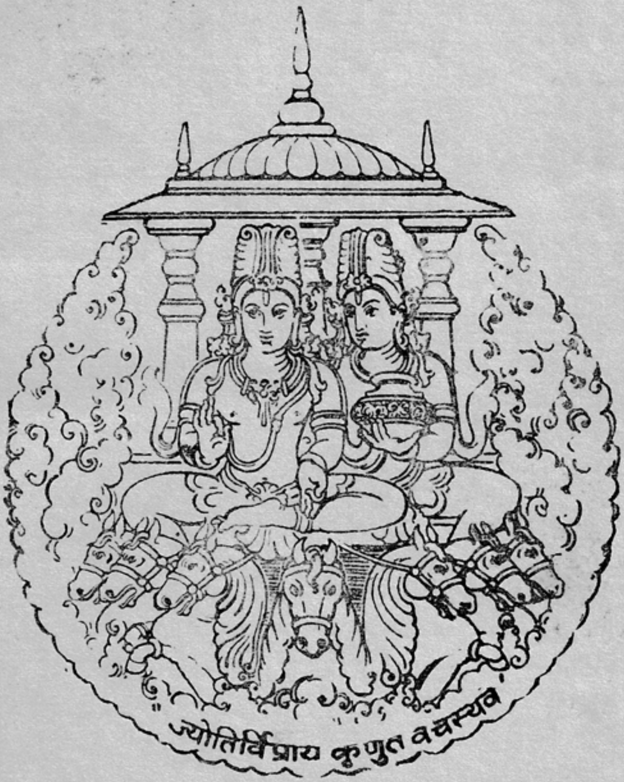

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television, radio, newspapers, journals and books to propagate its utility.

In many place in India yogic instruction have been made compulsory in schools and in others there are facilities to conduct the yogic practice voluntarily. Recently in U.S.A. some enthusiastic workers have started a University to make comprehensive studies on Yoga and its benefits. Thus thanks to the efforts of massive publicity media, yoga has in recent years become a most important weapon to control many of the psychosomatic disorders throughout the world. It has been adopted as a chief weapon to correct mental aberrations and similar other conditions. From this it becomes clear that Yoga has a bright future in alleviating human suffering, especially in overcoming modern stress disorders which are increasing in an alarming rate throughout the world. (Fig-1) Such an increase in stress disorders is partly due to the full control of infectious diseases, falling death-rates (with the consequent increase of older population) and to increased urbanisation and industrialisation resulting in over-crowding in the cities, with inadequate means for leading a comfortable life. Therefore, as the disorders of stress are increasing at a fast rate, various means for preventing the increasing rate of such disorders should also be taken promptly. Amongst various other things one can say with confidence that the practice of Yoga is one of the most powerful tool not only for preventing the development of such a disorder but also for curing many of these disorders in their early stages.

In spite of all these benefits conferred by Yoga, comparatively very few scientific studies have been carried out to find out the mode of its action in the human body. In fact there is some scepticism with regard to the utility of these procedures and some even highlight the harmful effects of Hathayoga undertaken & practised in an incorrect manner. On the other hand, the attitude of some people to the beneficial effects of Yoga is to explain it by reference to some mysterious power unknown to people & which cannot be tested by the currently available modern scientific methods Some even feel that Yoga increases the spiritual power of the body and mind & hence it can not be tested by any means of scientific instruments. These are some of the current views of the public and hence though there had been a fair amount of agreement among people that yogic practice does give rise to some benefits, its mechanism of action is still surrounded with some amount of mystery. It is with this background that we wanted to investigate

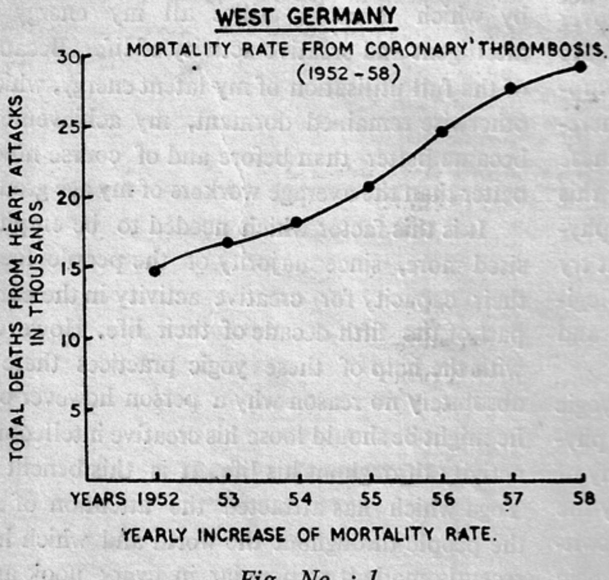

*Fig. No. : 1*

Shows yearly increase of Mortality rate from Coronary thrombosis in the years 1952–58. Please note in six years it increases from 15 thousand to 30 thousand in West Germany.

onstitution of the body. How-
our great surprisewe found that
for us to survey scientifically
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The methods of our investi-
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practice.

hand, supporters of yogic pra-
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posture in order to concentrate his bodily and mental power without utilising much of his muscular energy. Further, ordinary muscular exercises involve improved circulation of voluntary muscles. But in Yogic exercises, the voluntary muscles do not take that much part. On the other hand most of yogic exercises are directed towards improvement in the blood circulation of vital organs. Thus Sheershasana aims in improving the circulation of the Brain and Sarvangasana in the improvement of circulation of thyroid and other endocrine glands. Pranāyama usually aims at the improvement in the circulation of heart and lungs. In this manner various specific postures are aimed at improving the functions of specific organs without wasting much energy in supplying blood to the body muscles and other structures. In this way yogic practice has a selective action to specific organs and tissues and their functional status can be improved without giving rise to any wastage of bodily efforts. These are some of the specific areas into which we have scientifically investigated and the results are statistically confirmed to support our observation. However, most of our studies are preliminary in nature and they need a prolonged and intensive and in-depth study before we can say with certainty that the yogic practice has a definite advantage over the ordinary muscular exercises.

people could derive maximum advantage from these yogic practices. Here one should also remember that such yogic practices should always be learnt from an experienced teacher and not by engaging oneself in self-education or practice without the initial direction from a teacher, because an indiscriminate or incorrect method of yogic practice may be very dangerous and may produce more harm than good. Once in a while such cases of persons are seen who misused yoga resulting in great disappoint ments to the performer.

**Eight Methods of Yoga**

Amongst the eight methods of yogic practice described by Patanjali, the first two, Yama or restraining and Niyama or austerity are based on moral training. Without this moral practice, the remaining yogic practices will not give the full benefit. In this connection, Swami Vivekananda says, "As these two become established, the yogi will begin to realise the fruits of his practice, without these it will never bear fruit. A Yogi must not think of injuring any one, by thought, word or deed. Mercy shall not be for man alone but shall go beyond, and embrace the whole world". Therefore, the practice of these two methods which would be described in greater detail at a later stage, is the foundation for all the finer developments that take place in the subsequent practice.

**Asana or Postures**

The third method is the Asana or Posture. There are a large number of Postures described by various authors and described in treatises on Hatha Yoga. They are mainly meant to improve the bodily health, especially of the vital organs such as brain, heart, lungs, liver and other organs of gastro-intestinal tract, kidneys, and endocrines organs. This is in contrast to the classical physical exercises, the practice of which would mostly lead to improved circulation and strength to the muscles. Hence the practice of Asanas has a significant advantage over all the other methods of physical exercises and should be preferred, especially by those who have attained the age of 40 years or above. However, one should do it only that much which he can conveniently practise everyday without much strain on any of the vital organs. The details of the techniques are discussed elsewhere, but suffice it to say here that advantages of the practice of these yogic postures can not only be experienced by each individual, but can also be demonstrated scientifically by conducting various physiological and biochemical studies.

**Pranayama**

The Pranayama or Breathing Exercise is an important part of yogic exercise, in which one inhales the air to the maximum capacity through one nostril after closing the other through the tip of the thumb or middle finger as the case may be on the right or left side. He holds the breath for a short while and expires the air through the other nostril by producing a deep expiration. One should do it 20 times in a day either in the morning or in the evening. It is the experience of everyone who practised it properly that one feels very much refreshed and light psychosomatically at the end of pranayama practice. Probably because of an improved circulation and increased oxygenation of every cell in the body, one experiences such a feeling of well-being. If one practises it everyday one feels very much fresh and elated. But all these things cannot be understood fully unless one practises it and gains experience with it.

**Mental exercise**

After completing all these bodily exercises one goes to take up practise of next higher stage of yoga which are the exercises of the mind.

They are (a) Pratyahara or restraining of sense organs from their objects, (b) Dharana or concentration of the mind on any specific object, (c) Dhyana or meditation on the same object, (d) Samadhi or attaining the state of superconsciousness. All these four steps of mental exercises are the important measures to attain our goal provided we practise them everyday regularly and we develop a full faith in reaching the goal through these means. Unless we develop a strong feeling for them our attempt may remain half-hearted & therefore the results may also not always be uniform and good.

**Ancilliary measures**

Hence, the regular practice of yoga with full enthusiasm and faith is the sheet anchor in getting the assured success. At first he must care of his diet and it should be simple, measured quantity and less spicy. Similarly his living standard should also be simple and one should give up all vain talk. He should read only those books which have been written by well-known authorities on the subject. In short, he would have to give up all other interests in the unproductive and unprofitable matters and to concentrate only these measures. But one must also realise that he need not renounce everything in life to practise yoga, as was suggested by some of the extremists. One can always lead a normal civilised life and do his normal duties in whatever employment he is in; but only thing is that he can mould and adapt his life in such a way by constant practice that he can follow principles of yoga throughout the day and night by maintaining a full mental equanimity and renunciation. This is the lesson one can follow from yoga in our everyday life and it is this practice that would ultimately help us to reach our goal.

**Prevention of ageing.**

Stress of life many a time causes premature ageing. A regular practice of yoga delays the ageing process and also produces, very often, a prolongation of life. A personal narration (see Appendix) of Mr. Arnold who lived for 110 years will be interesting to all the readers.

## PHILOSOPHY OF YOGA

In science, one should be able to measure all the factors he encounters by his direct observations. Formerly only the objective methods were used for measuring various scientific truths. In recent times even the subjective methods have been used to assess the various values; especially in different branches of psychological, biological and clinical science. Thus the benefit of yogic practice can now be measured both by subjective and objective methods. In the initial period the subjective experience of the person dominates, but later on one can measure these changes even by various objective scientific methods.

As will be discussed later, it is gratifying to note that we could demonstrate many physical and mental changes taking place in volunteers undergoing particular types of yogic practice, when we applied different modern psychological tests. These changes were found consistently in all the subjects who have undergone same type of yogic practice. Similarly when we studied such volunteers with various physiological and biochemical tests involving each system of the body, we could get consistantly uniform results. The results of neurohumoral studies, electroencephalographic studies and different hormonal and metabolic studies consistently showed certain changes which could be reproduced in the individual subjects at a given time. Hence, there should not be much hesitation in accepting these scientific truths by the people all over the world.

However, when we pass through certain

borderline areas between science and mere specultion, the facts may not be accepted by all, since they are mostly based upon subjective experiences, which one can possibly get, if one undergoes proper training under an experienced teacher or guru. Since it is hard to get such experienced teachers throughout the world, these facts mostly remain in the realm of speculation. However, for those fortunate ones who could come across some experienced teachers and who are fortunate enough to get the necessary systematic training, it may become a scientific truth. In this connection it would be relevant to quote Swami Vivekananda who says, "The Science of Raja-Yoga in the first place proposes to give us such a means of observing the internal states. The instrument is the mind itself. The power of attention when properly guided and directed towards the internal world will analyse the mind and illuminate facts for us. The powers of the mind are like rays of light dissipated. When they are concentrated they illuminate. This is our only means of knowledge......from our childhood upwards we have been taught only to pay attention to things external, but never to things internal. Hence, the internal mechanisms are unknown." Yet this is the only way to do anything in the nature of a scientific approach to the subject. "The world is ready to give up its secrets if we only know how to knock, how to give it the necessary blow. The strength and force of the blow come through concentration. There is no limit to the power of human mind. The more concentrated it is the more power is brought to bear on one point, that is the secret."

### Concentration of mind

From the above it becomes clear that if one develops the power of concentration of mind by constant practice, he may not only have a subjective experience of having psychosomatic changes in himself, but in due course of time find that these various changes can be objectively measured through modern scientific methods. However, the method of practising concentration of mind is not yet scientifically standardised and there can be much individual variations in the methods depending upon the psychic and physical body variations in each person. Hence, at present it would remain a borderline discipline between science and speculation till the technique of concentration is fully standardised.

### Source of yogic philosophy

The philosophical basis of yogic practice are sometimes traced to the Bhagavad-Gita. In this work the various ways of life which are possible with the help of different types of yoga have been discussed extensively. Further, it had also described the human beings with three distinct types of personalities as constituted by three gunas namely *Satwa* or purity, *Rajas* or passionate or *Tamas* or ignorance. Therefore, depending upon the personalities of an individual, one can choose a corresponding type of yogic practice each one of which would ultimately lead the person to enjoy eternal bliss. Briefly speaking the *Gīta* had described 3 types of yogic practices, the details of which will be given elsewhere. They are (1) Karma yoga meaning thereby attainment of ons's goal through continuous and sincere work, (2) Seeking God the Almighty through love and devotion is called Bhakti yoga, (3) Seeking the same through philosophical knowledge is called Jnana Yoga. These different methods have been described in the Gita just to suit the different categories of people with different personalities. One single method may not suit all the persons living in the world and hence each individual will have to select at least one of these methods suitable to his personality and character to reach his goal.

**Kundalini yoga**

According to tantric literature there are six chakras or centres in the body, the lowest in the perineum called Muladhara Chakra and the highest in the forehead called Sahasrara. They are connected to each other through many channels. Amongst them Ida, Pingala and Sushumna are the important ones. According to modern physiology these chakras can be equated with various autonomic ganglia, like caeliac ganglia to which both sympathetic and para-sympathetic nerves (which canbe compared to Ida and Pingala) give their respective tributaries or Nadis. Possibly the Sahasrara can be compared to hypothalamic region, where both the sympathetic and para-sympathetic nerves have their central connections. The Sushumna Nadi can be compared to the spinal cord through which also all these centres or Chakras are well connected. Normally the Kundalini Shakti or Serpentine power remains at the Muladhar Chakra as a potential energy just as serpent remaining in a quiet and coiled state. However, by constant practice one can awaken or activate this latent power at will by the specific meditative process of the mind. If one can successfully channelise this Kundalini power through successive steps of various chakras; he will not only control his autonomic activities and sensory inputs, but will also be able to acquire skills and powers of mind which can be considered as supernormal. Because of this, there has been a great interest in this aspect of yogic practice, and hence this subject will be further discussed at a later stage.

## A BRIEF REVIEW OF BASIC YOGIC LITERATURE

**The Bhagavad Gita**

In The Bhagavad Gita, the central point of teaching is "Karma Yoga" meaning thereby devotion to the discharge of one's own social duties without expecting anything in return. Thus Lord Krishna says "your concern is solely with the action, never with its fruits." This leads one to a state in which he is bound to carry on his duties to the best of his abilities without expecting to reap any of its fruits. An important outcome of such an action is that one can act with complete equanimity of mind and without attaching any motive for deriving any personal benefit therefrom. Further, it also emphasises the spirit of renunciation in all walks of our life.

Further, the Gita also emphasises, that "all work should be done honestly and disinterestedly for the welfare of the community and not for the satisfaction of personal desires." The performance of one's allotted task is specifically described as follows. "It is better for one to do even imperfectly the duties that fall to one's lot than to do those of others perfectly. One should not abandon one's natural duty even if evils attached there to. Every human activity involves some evil as fire carries smoke. He, whose mind is in every way detached, whose self is conquered, who has freed himself from selfish longings, attains by dint of that detachment the attributes attached to worklessness."

In this connection Rajaji writes, "The absolute happiness can result only from liberation and it follows therefore that spiritual enlightenment alone which frees the soul from all illusion, can liberate the soul by breaking the bound of "Karma" the eternal chain of work and result." It is necessary to point out that enlightenment does not mean learning much or little. Indeed enlightenment *(Jnāna)* is not an intellectual state, but a state of spiritual awakening which comes through moral rebuilding. Purity of life and a mind free from selfish desires are essential for enlightenment. Without full moral self-control no enlightenment is possible.

Further, it has also been emphasised that the sense organs are the windows or openings of the mind directed outwards. But some who are blessed with free understanding turn their minds inwards and realise the self within. Others ignorant of these possibilities, pursue external pleasures and fall into the trap of birth and death. Those with steady mind do not spend their thought on such transient pleasures, but seek the joy of liberation.

According to Gita such a joy of liberation can be attained through many pathways such as by enlightenment or *jnāna yoga,* by faith in worship or *Bhakti Yoga* or by way of good work of *Karma Yoga.* In recent years all these methods were greately popularised by Swami Vivekananda and Sri Aurobindo.

## Gita and Meditation

The Bhagavad Gita further advises as tohow one should carry on meditation in order to control his body and mind. It says that such a person desirous of practising yogic meditation, should seat himself on level ground in a clean place. He should have a firm seat consisting of 'Kusha' grass, a leopard skin and soft linen and then control his thoughts, senses and movements in such a way that he can concentrate his mind with a sole object of purifying himself from all the evil forces. Normally such a person should eat neither too much nor too little, should neither sleep too much nor live without sleep. He should thus lead the middle course of life and avoid extremes. However, such an avoidance of extremes mentioned in the Gita is quite unlike the strictly regimented process of yoga advised by Patanjali to be disucssed later on. Gita further advises that the person who practises meditation should have steadiness of posture, with head and shoulders straight, should avoid looking to either side and fix his eyes on the tip of his nose.

Then he starts meditation by holding his mind fixed on himself inwardly and by shaking off of the attachments of sense organs from their outwardly available sense objectives. One can attain such a state only by persistent and self-confident efforts and without being depressed by early failures. When a person attains such an union with his inner self, he is like a motionless flame of a lamp in a still place undisturbed by all attractions and unruffled by all passions. Swami Chinmayananda while writing an Introduction to his well-known commentary on Bhagavad Gita described the mind as follows "Mind is the Man. As the mind so the individual. If the mind is disturbed the individual is disturbed. If the mind is good, the individual is good."

He further states that such a mind has two distinct sides. One faces the world outside and the other one facing within which reacts with these impulses. The outer mind receives all the stimuli from different worldly objectives. Hence, it is named as objective mind or manas. The inner one which assimilates these external stimuli is called subjective mind or buddhi. Continuing with the same topic he states "That individual is whole and healthy in whom the objective and subjective aspects of his mind work in unison with each other and when at moments of doubts the objective mind readily comes under the disciplining influence of subjective mind. But unfortunately excepting in a rare few, the majority of us have minds that are split. This divorce between the subjective and objective is mainly created by a layer of egoistic desire in the individual. The greater the distance between these two aspects of the mind the greater the inner confusion in the individual" (which ultimately leads to emotional stress).

The main cause of creating such a distance between the two is the multipronged desires which ultimately lead us to develop attachment, anger and greed and which are considered as the three gates of hell. It is only through the yogic practices as explained in the Bhagavad Gita that one can try to bring the subjective and objective aspects of the mind together into a happy union. Then only the objective mind becomes well disciplined to act faithfully as per the guidance of subjective mind. This can be achieved only by removing the dividing factors the "egocentric desires". When one gets over these desires by his selfless action he attains a status of equanimity which enables him to become skilled in all types of action. On the other hand, if the two aspects of mind are allowed to drift from each other, he becomes an easy pray to a host of psychosomatic stress disorders.

The central idea of the Gita is the control of sense organs and more particularly the control of desires and attachments, in order to attain state of peace and contentment of mind. Further, the Gita tries to show how one can lead a normal life of duties and responsibilities and yet be in state of equanimity. Therefore, the various practical methods described in this well-known treatise are discussed in great detail towards the later part of this book. By following these methods it would be possible for every one to achieve the goal for remaining in a state of peace and tranquillity.

Thus in the Bhagawad-Gita the word 'Yoga' has been used with different meanings at different places, the real meaning of yoga is the union or synthesis of body and mind in such a way that there is perfect equanimity under any circumstances of success or failure, pleasure or pain. Such a state of equilibrium in the body-mind relationship reached through self-control and internal peace has to be attained through constant practice and has to be maintained with great vigilance. Without it Yoga is often acquired and lost.

**Patanjali's Yoga Sutra**

In all the available literature on yoga, Patanjali's Yoga Sutras stand out as the most basic and authoritative treatise. In its 196 sutras (or short aphorisms) Patanjali had condensed the essential technique and philosophy of Yoga in such a manner that it surprises every reader of this text. Vyāsa has written a detailed commentary on each of the sutras.

In the first section Patanjali deals with the general nature and technique of Yoga. In the second sutra he defines Yoga as medium through which one can control the activities of the mind. Since Samadhi is the essential goal of Yoga, the methods to achieve this goal are discussed in the first section called 'Samadhi-Pada.' In the first part of second section the author deals with the subjects of Klesha or unhappiness of mind, in order to provide answer to the question as to why one should practise yoga. It gives the detailed analysis of human life and the sufferings inherent to our life. The second part of this section deals with the first five of the eight yogic practices namely Yama, Niyama, Āsana, Pranyama and Pratyahara, all of which are also known as external procedures. Details of these procedures have been described later on. Suffice it to say here that these five practices are of a preparatory nature and are meant to make the person fit for the practice of the ultimate state of Samadhi. As this section is mainly intended to make the aspirant to become fit physically, mentally, emotionally and morally for the practice of higher yoga it is called Sadhana Pada.

In the third section of this book, the techniques of the remaining three practices of Yoga namely Dhāranā, Dhyāna, and Samādhi which are referred as internal exercises of the mind

**Plate I**

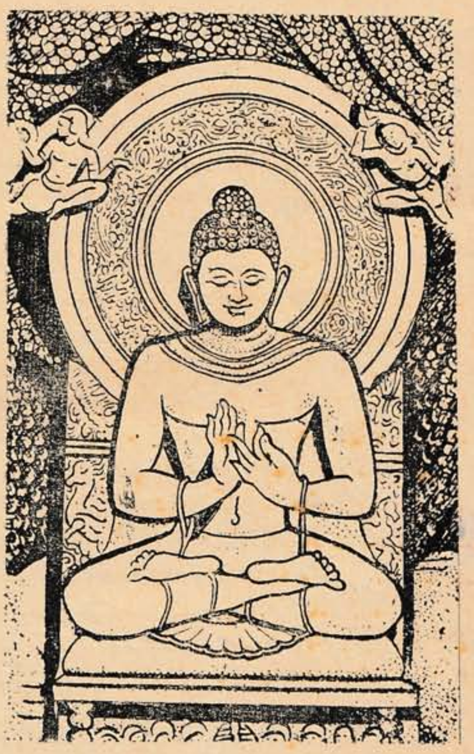


Fig. 5 : Gautam Budha who preached Meditation about 2500 B. C. ago.

and also their accomplishments which can be reached by the practices of these methods. In the fourth section the author had expounded all the essential philosophical problems which are involved in the study and practice of Yoga. The nature of mind, and its perception, liberation and the result of these are dealt with briefly yet systematically for a proper understanding of the problem. On the whole, Patanjali's Yoga Sutras with the commentaries are the most authoritative texts for a deep and systemetic study of Yoga. In fact this fundamental treatise on yoga would be most useful for those who have lost faith in the ideals of our ancient religion and culture. Such people usually get much enlightenment in studying the philosophy of yoga for the solution of their problems connected with their inner life.

There is another purpose for studying this basic text on yoga. Because many times some teachers of yoga belonging to certain schools, have advocated yogic practice as consisting merely in performance of asanas or pranayama. These practices, though very useful for building a healthy body, and a sound physical life, cannot be divorced from the essential and higher intellectual teachings of yoga. However, when one starts studying this text he finds that yoga philosophy is enveloped with so much mystery to be of little practical value to his everyday life. In this connection Taimini states, "To a certain extent this atmosphere of mystery and obscurity which surrounds Yoga is due to the very nature of the subject itself. The philosophy of Yoga deals with some of the greatest mysteries of life and the universe and so it must be inevitably be associated with an atmosphere of profound mystery. But much of the obscurity of Yogic literature is due, not to the intrinsic profoundity of the subject, but to the lack of correlation between its teachings and the facts with which an ordinary educated man is expected to be familiar." If the doctrines of yoga are studied in the light of both ancient and modern thought it is much easier for the students to understand and appreciate them. Because of these reasons one should study and practise yoga not only from the point of view of phyiscal health but also from the psychological and philosophical point of view in order to achieve the goal of developing a higher intellectual life. To a large extent we can achieve them by making adeep study of Patanjali's Yoga Sutras and then practising its teachings in our daily life. We will discusssome of these problems later on while dealing with the psychological aspects of yoga.

## Buddhism and Yoga

Buddha was born about the middle of sixth century B. C. His name was Siddhartha and he belonged to the ancient family, Gautama. The title of Buddha, which means "awakened one" came to be applied to him afterwards as a sign of enlightenment. He was born in an aristocratic family near Kapilavastu on the lower slopes of Himalayas. He was a young man of about thirty years when he renounced the world and left the palace for the forest in search of truth. The main cause of renunciation was the thought of suffering which he saw afflicting the mankind as a whole. By constantly meditating on it for years together, truth at last flashed upon him with regard to the nature of human suffering and the means of eradicating it. Since he was a true lover of mankind, he did not spend the rest of his life in the forest, but returned to the level of men to spread a knowledge of truth which had brought him illumination and freedom. In this mission he achieved a remarkable success and his teaching spread widely in course of time and eventually grew into a world religion.

Buddha wrote no books and all his teachings were compiled by his desciples.

Buddha who is sometimes styled as great teacher, looked upon "life" with its sufferings as a disease and his method was that of a doctor seeking a remedy for it. According to Buddha, the main cause of suffering is ignorance. From ignorance one proceeds to desire. Desire leads to activity which brings in its turn the development of fresh desires. This is the vicious circle of life. Thus when ignorance is dispelled by right knowledge the vicious circle is broken and one can become free from sufferings to attain peace or "Nirvana". The path of self-descipline which helps to remove his sufferings is eight-fold. It is (1) right faith, (2) right resolve, (3) right speech, (4) right action, (5) right living, (6) right effort, (7) right thought and (8) right concentration. According to this scheme "Right knowledge" or "Prajna" should be more than mere intellectual conviction however strong it may be. It should be knowledge transformed into our own experience. Buddha often declared that we must accept only what we ourselves have realised to be right.

According to Buddha every man should win his own salvation. It is salvation through self-reliance, not by the grace of God, or under the guidance of any external authority. Even the Guru or teacher can only show the way. For knowledge to become internal certainty self-restraint and Samādhi or concentration are necessary. There can be no realisation of truth without a self-control of thought and action. The practice of meditation is an aid in securing tranquillity of mind and in gaining a clear insight into the truth that has been learnt from others. By constantly practising these methods one reaches "Nirvana" or a life of perfect peace and equanimity. It is this perfect calm to be reached within the four corners of the present life that Buddhism aims at and it is through these self disciplines that one can expect to attain one's ultimate goal. (Fig. 5)

**The Philosophy of Buddha**

Just as a medical man who attempts to cure bodily illness, by asking first about the patient's complaints, arrives at diagnosis, assesses the prognosis and then treats the patient, in the same way Buddha, after a prolonged meditation, preached his four noble truths to his first five disciples in the deer park near Banaras (Saranath) and became the spiritual doctor of mankind.

(A) At first he felt that life is extremely sorrowful, because disease, decay and death are sorrowful. Similarly union with the unpleasing is sorrowful just as separation from pleasing is sorrowful. In short the wish one does not fulfil is sorrowful.

(B) Buddha answers the cause of such a suffering "as the recurring craving associated with enjoyment and desire, seeking enjoyment everywhere, and craving for sense pleasure. In short craving is the cause of suffering and not guilt or sin."

(C) Is it possible to supress the endless sufferings ? Buddha says, "Yes". It is possible. Thus cessation of sorrows is the cessation of this very craving so that no remnant or trace of it remains. In fact there should be complete renouncement and abandonment of desires, before one can get peace.

(D) Thus the remedy for achieving our goal is the Noble Eightfold Path described by Buddha as already explained. Thus he placed his chief emphasis on high morality and thought and therefore he could provide mental peace to the large number of followers, a great achievement indeed.

**Recent literature**

Based on various classical treatise on the philosophy and practice of yoga many books and monographs have been written as a result of the authors' own study and expertence. Thus the volumes written by Swami Vivekananda and Sri Aurobindo in recent years are the examples of such studies. Swami Vivekananda mainly popularised the philosophy of the Gita into three forms, namely Karma Yoga, Bhakti Yoga, and Jnana Yoga. In addition he also popularised the fourth form of yoga, the Raja Yoga, for which he mostly referred to the techniques of meditation as described in Patanjali's Yoga Sutras. Since Vivekananda was an eloquent orator and a prolific writer, all his speeches and writings have come in the form of books. Those interested in the study of his thought may refer to his original writings.

Similarly Sri Aurobindo has also contributed greatly for the philosophy of yoga. His main contribution had been into the field of consciousness and superconsciousness. His main emphasis had been that every individual by constant practice of yogic concentration as described by Patanjali, can attain enlightenment and reach the sphere of superconsciousness. If by constant practice of such meditation and concentration one can achieve the goal of superconsciousness then it will have a tremendous impact on the life of that individual, especially with regard to his creative thinking and action. All these writings of Swami Vivekananda and Sri Aurobindo will be discussed in greater detail now.

**Sri Aurobindo's Synthesis of Yoga**

According to Sri Aurobindo, Yoga is a method by which one can attain perfection in life by realising one's divine potentialities and then to make an all out attempt to unite with it. One can cultivate such a power during his life both subjectively and objectively by following certain well-known techniques of Raja Yoga. Just as a scientific analysis and synthesis of a chemical compound leads to same result, in the same way yogic analysis of perception and experience of our inner forces can be separated and dissolved and then transformed into a new force by fixed internal processes. Thus Sri Aurobindo says, "All methods grouped under the common name of yoga are special psychological processes founded on a fixed truth of nature and developing out of normal functions, powers and results which were always latent but which under ordinary movements do not easily or do not often manifest."

But development of such a power should not blind us from attending to our normal life process in response to the action of various external forces. In fact a full synthesis of external manifestations of life with the transformed inner divine forces of life is called yoga. Such a transformation of inner life can be brought about by the purification of nervous and vital energies and then to control and utilise them for divine realisation for the fulfilment of ultimate aim. Our first attempt should be to purify and control the bodily life, then to evolve the next and superior instrument the mental life and then to liberate our divine life by the discriminative and imaginative process. Thus Sri Aurobindo states—"we perceive then these three steps in nature, a *bodily life* which is the basis of our existence here in the material world, a *mental life* into which we emerge and by which we raise the bodily to higher uses and enlarge it into a greater completeness and a *divine existence* which is at once the goal of the other two and returns then to liberate them to their highest possibilities." Thus Sri Aurobindo clearly emphasised the role of yoga in divinising our life as the main goal. (Fig. 6)

### The three fold life

Thus it is well established that the main purpose of life is to perfect the physical body, to fulfil the progressive aims of the mind and to develop the transcendent activities of the divine spirit. Thus Sri Aurobindo states–"As a result of their seperate formulation in nature man has opened to him a choice between three kinds of life, the ordinary material existence, life of mental activity and progress and the unchanging spiritual beautitude. But he can as he progresses combine these three forms, resolve their discords into a harmonious rhythm and so create in himself the whole Godhead, the perfect man."

Amongst these three the physical body tries to seek immortality by way of self preservation, self multiplication and reproduction. The main characteristic of mind is to change. More it acquires elevation, more it improves and enlarges. According to Sri Aurobindo, Mind, unlike bodily life, is infinite in its field, elastic in its expansion, and easily variable in its formations. The main characteristic of spirit is its immortality and perfection. The glory of spiritual life is the realisation of its presence in all the things in the world and beyond, equally blissful in the universe and out side it.

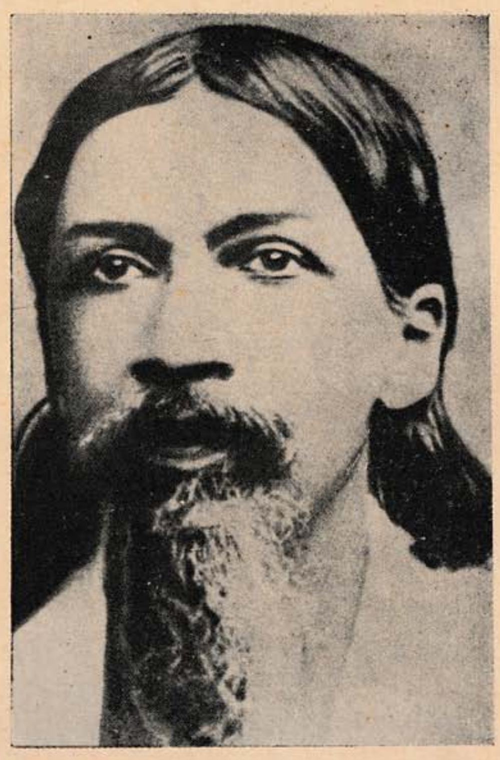
In each of these three levels nature acts both individually and collectively. Similarly the man can also seek his individual good from any or all these three spheres of activities. Thus the man interested in spiritual attainment should strive hard to put best in himself by thought and action to his surroundings in such a way that the whole humanity may arise nearer to his likings of attaining supreme personality. In this connection Sri Aurobindo says- "The progressive mind is seen at its noblest when it strives to elevate the whole race to its own level whether by showing broadest the image of its own thought and fulfilment or by changing the meterial life of the race into fresh forms of religious, intellectual, social, or political intended to represent more nearly that ideal of truth, beauty, justice, righteousness with which the man's own soul is illumined." In this way a man leading a spiritual life can always effect moral changes in the humanity at large and divinise them through the process of yogic spirit. our main aim should not be to limit the liberation of our own life through yoga, but also should extend to the liberation of others and the mankind as a whole. Continuing the same idea Sri Aurobindo says. "Spirit is the crown of universal existence, matter is its basis, mind is the link between the two. Spirit is that which is eternal, mind and matter are its workings. Spirit is that which is concealed and has to be revealed. Mind and body are the means by which it seeks to reveal itself." Such revelations can be quickened by following yogic principles and practice which prepare the mankind for higher evolution and for spiritual existence. Therefore it is for the man to fully realise these great potentialities in himself and then try to divinise by entire life through different yogic means.

### Systems of Yoga

The main purpose of practising different types of yoga is to harmonise these three parts of the individual namely body, mind and spiritso that they function with complete unison amongst themselves and also with the world out side namely the nature and God. Such a harmony can be accomplished gradually by several methods of yoga. Thus Hatha Yoga ( Asana and Pranayama ) selects the body and its vital functionings as means of perfection and realisation and its main aim is to achieve the

**Plate II**

Shri Swami Vivekananda, an ardent exponent of Yoga to the Modern world.



Shri Aurobindo who preached Yoga for divinising our life.

Figs. 6 & 7

goal through the bodily activity. Raja yoga (concentration and meditation) aims to achieve the goal through different types of mental process such as through work (Karma Yoga). Love (Bhakti yoga) or through knowledge (Jnana-Yoga). Through the means of postures and breathing exercises one can keep the body free from all the impurities and can maintain a good health, prolonged youth and longevity. However the practice of Hatha Yoga alone will only preserve the physical life to the highest perfection without influencing much of our mental and spiritual life process. Moreover the Hatha yoga is more laborious, time consuming and difficult process and it may not suit every one in their ordinary life. Thus Sri Aurobindo concludes—"Hatha Yoga attains large results, but at an exhorbitant price and to very little purpose." Continuing he says, "Raja Yoga takes a higher flight. It aims at liberation and perfection of not of bodily but of mental being, the control of the emotional and sensational life, the mastery of whole apparatus of thought and consciousness." Thus by the following techniques of Raja Yoga, one can maintain not only the bodily health, but also the pure pleasant and clear state of mind and spirit. The triple path of yoga, namely knowledge, devotion and work differ from Raja Yoga, since it does not involve much mental training and practice of meditation and it mainly involves an internal devotion and meditative concentration on God. However, it is indifferent to bodily and mental perfection and each one of the methods works exclusively to other established methods of Yoga. Thus the path of knowledge aims at the realisation of the supreme self by the method of intellectual exercises. The path of devotion aims at the enjoyment of supreme love and bliss and utilises the conception of the supreme lord. Here the worship and meditation are used for increasing the intensity of our divine relationship. The path of work aims at the dedication of every human activity to the supreme or God almighty. It begins with renunciation of fruits of all our activities. By this renunciation it so purifies the mind that we become conscious of the great universal spirit or the supreme power which enables us to do these activities. However if we go deeper into all these methods we can realise that all can be combined and the purpose of all these methods serve to the same namely the perfection of bodily, mental and spiritual life.

**Synthesis**

From the above it becomes clear that there are many different methods of Yoga each emphasising their own sphere of activity of the life. But ideally speaking there should be a synthesis of all these methods for a common good of humanity as a whole; otherwise we would be wasting our energy in our short span of our life in studying these methods one by one and then practising each one of them one after other. According to Sri Aurobindo, such a synthetic approach had been made in tantric method though even this method went into disrepute to some extent due to obscuration of principles. However, in Tantra they recognise nature or energy or will power as their central point through which they aim to attain perfect discipline, perfection and beatitude of the soul. Thus they mainly worship energy or Sakti as the sole effective force for all attainment. The realisation of the presence of such a central force-energy is through the attainment of knowledge and also by developing faith. Therefore, yoga seems to be a kind of a practical psychology in conceiving the nature. In life there are two types of nature—lower and higher. The lower one is derived from ignorance and ends up in the life of ego. But the higher one is the nature of knowledge and it manifests itself in life divine. The transformation of life from lower nature to that of a higher one is the main aim of integral yoga. Such a transformation is very aborious task and needs collosal faith and absolute courage to attain it. There is no royal road to achieve the goal and it varies depending upon each individual and his faith. Then we fashion our attaining the goal of using divine power for the betterment of our life. Thus in every experience we get in our life good or bad we see a divine power in it and take the full advantage of uplifting ourselves from lower to the higher nature. Even in the yogic methods of knowledge, love and work the ultimate aim is the same namely the liberation from lower to the higher nature through various specific methods of perfection. Such a perfection includes perfection of mind and body through Raja Yoga and Hatha Yoga and therefore these must be included in the integral yoga as means to attain the higher nature. Summarising his ideas Sri Aurobindo says—"The divinising of the normal material life of man and of his great secular attempt of mental and moral self-culture in the individual and the race by this integration of a widely perfect spiritual existence would thus be the crown alike of our individual and of our common effort." From the above it becomes clear that Sri Aurobindo's conception of Yoga is the integration of all the available methods so far described with the sole aim of uplifting one self from lower to the higher nature. It is this concept which had attracted humanity at large and if one follows his ideas closely there is no doubt one should achieve the goal without much difficulty.

**Swami Vivekanand's views on Yoga**

According to Swami Vivekananda Science of Yoga or Union can be divided into four types. They are–

(1) *Karma Yoga* is a method by which one seeks the union of man with humanity as a whole through his selfless work.

(2) The type of yoga which seeks such a union of man with God is called *Bhakti Yoga,*

(3) If one attains such a union of man with higher consciousness or spirit through meditation then it is called *Raj Yoga.*

(4) A person who seeks the union with God through his philosophical knowledge then it is called *Jnana Yoga.*

Swami Vivekananda has written considerably on these four types of *Yoga* and those who want to know more about his views may refer to his original writings. We would touch here briefly his views on this subject.

(1) **Karma Yoga**

This is nothing but an effort to attain God through his work. In society there are such people who may not be very good in original thinking or concentration. But they are good at achieving their goal through hard work. Although everyone of us is engaged in doing some work, still most of us fritter away our energy due to ignorance of secret of work. The Karma Yoga explains this secret as to how to do the work with advantage to all concerned. Thus one should remember here that all misery and pain come from attachment. Therefore, if one works with motive or attachment it results in pain and misery. Vivekananda states—"I want to do work, I want to do good to human being and it is ninety to one that human being whom I have helped will prove ungrateful and to work against me and the result to me is pain. Such things deter mankind from working and it spoils a good portion of the work and energy of mankind, this fear of pain and misery. Karma Yoga teaches us how to work for work's sake, unattached without caring who is helped and what for......His position in this world is that of a giver and he never cares to receive anything.

He knows that he is giving and does not ask for anything in return and, therefore, he eludes the grasp of misery; the grasp of pain whenever it comes is the result of the reaction of 'attachment' ". From the above it is clear the secret of Karma Yoga is the selfless work with no attachment whatsoever on the benefit.

## (2) Raj Yoga

This is a process through which one can control the mind. Normally there are three instruments of knowledge, instinct, reason and inspiration which are present in dorment condition in all the human beings. The instinct is well developed in animals, the reasoning in all the human beings and the inspiration mostly in God-men or spiritual leaders. All these three instruments are interdependent and do not contradict each other. The method one can adopt to control mind is through the power of concentration. More one developes the power of concentration, more knowledge one can acquire. Similarly the stronger the power of concentration the better will be the thing be done. In the system of Raj Yoga one tries to avoid frittering away of mental energy in hundreds of things at a time. Thus Swami Vivekanand says—"As soon as I try to calm my thoughts and concentrate my mind upon any one object of knowledge, thousands of undesired impulses rush into the brain, thousands of thoughts rush into the mind, and disturb it. How to check it and bring the mind under control is the whole subject of study in Raja Yoga". The method of such concentration and its results so far attained by people experienced in this field convinces us that it has an important role to play in improving the mental actvity of the human beings.

## (3) Bhakti Yoga

Through this yogic practice the man with high emotion practices his love and affection to the God and thereby the humanity at large. He loves God through prayers, rituals, flowers, buildings and all such things. It is these offerings that act upon the human mind to surrender himself to everything in nature and to remain humble and polite. He finds all the supreme ideals and good things in God and therefore he worships him everyday. Thus Vivekananda says—"Bhakti Yoga teaches them how to love without any ulterior motives; loving God is loving the good; because it is good to do so, not for going to heaven, nor to get children, wealth or anything else. It teaches them to pay all kinds of tributes to God as the Creator, Omnipresent, Almighty Ruler, the Father and the Mother. The highest phrase that can express him, the highest idea that the human mind can conceive of him is that he is the God of love". Thus, through Bhakti Yoga one can serve the God and his creation, the entire world through constant practice of love and affection.

## (4) Jnana Yoga

Through this one learns about God through the process of reasoning and thinking. He is not satisfied with what he sees everyday in this world. He wants to go beyond these things in nature and find out how the life and its activities are created. He gradually realises there is something beyond all these things that we see which controls our mind and body and which is called God in the universe and soul in our own individual body. Vivekananda says—"He thinks that this world is a vain show. Yet again the senses drag him and he begins as before to eat the sweets and bitter fruits of the world. Again an exceptionally hard blow comes. His heart becomes open again to divine light thus gradually he approaches God and as he gets nearer and nearer he finds his old self melting away. When he has come near enough, he sees that he is no other than God.........This is what jnana yoga teaches. It tells man that he is essentially divine. It shows to mankind, the real unity of being and that each one of us is the Lord God himself, manifested on earth. All of us, from the lowest worm that crawls under our feet to the highest being to whom we look up with wonder and awe—all are manifestations of the same Lord." The full realisation of these ideas in our mind through constant thinking and practising will ultimately help us to imagine the infinitely small role that we play in this vast area of universe.

Swami Vivekananda further emphasised the fact that we should not only realise the importance of all these four types of yogas described above, but also should try hard to practice them in our everyday life. Thus he says, "It is imperative that all these various yogas should be carried out in practice. Mere theories about them will not do any good. First we have to hear about them, then we have to think about them. We have to reason and thought out. Impress them on our minds, and we have to meditate on them, realise them until atlast they become our whole life." Thus, unless we practise what we teach on Yoga, no useful purpose will be served and that is what Swami Vivekananda emphasised about Yoga throughout his life.

## YOGA AS A "PHYSICAL CULTURE"

There are a large number of books and monographs in different languages which mainly deal with the physical culture aspect of Yoga. Amongst them "Hatha Yoga pradipika" and "Gheranda Samhita" written in Sanskrit seem to be the earliest ones. Both these treatises describe in great detail the various Asanas or Postures, the techniques of Pranayam, and also the different cleansing procedures. The most of these procedures have been described in suffiicient detail in later chapters. Suffice it to say here that these are only two of the basic Sanskrit texts, based on which the subsequent books and monographs have been written. All these books in different languages not only give the details of techniques of yogic exercise, but also the benefits that can be derived from these practices. It is because of these extenisve literature that the yoga has elicited international interest in recent years. Unlike the technique of meditation, the techniques of yogic Asanas and other procedures are easy to understand and practise. Even the common man with comparatively lesser educational background can derive full benefit from it. Further it was also observed and experienced by many that the beneficial effects of yogic asanas on the body and also on the mind is comparatively quick and the person gets a feeling of physical well being much earlier than what one gets after meditation. Hence, the practice of yogic exercises has a great bearing on the maintenance of positive health of the individual, especially among the middle-aged and older people. Because of these quick beneficial results, the yogic exercises have now been accepted as a safe and effective measures for maintenance of good health, and in preventing many constitutional diseases, aging and other degenerative diseases. Because of these enormous beneficial effects, many medical scientists became attacted to it. They have in recent years conducted many scientific investigations to enquire into the question of how these yogic practices produce such benefits. Therefore, it will not be out of place to mention a brief review of these studies.

## SCIENTIFIC STUDIES ON YOGA

Anand and Chinna were the first to conduct the scientific studies on yogis of different states of bodily and mental activity. These yogis by constant practice had acquired a good control over their autonomic nervous system through which they could control the activity of the cardiovascular system and also the respiration and metabolic rate at their will. Because of this, they were able to lower the heart rate to the bare minimum of three to four affective beats per minute as seen in the electrocardiogram. The E E G showed a reversion to alpha waves and some times even the theta waves during the period of voluntary control. They could also reduce their respiratory rate to 5 to 6 per minute at their will. Because of this voluntary control over autonomic nervous system they could reduce their metabolic rate to a much lower level.

Based on these principles only, some of the yogis could go into a state of samadhi underground and remain there for days together. The physiological changes that took place in such yogis remaining underground fully covered from all sides was reported by Kothari and his colleagues recently. In this case the entire bodily function went into a state of severe depression leading to a state like "hibernation." However, after 48 hours when the yogi had awakened, his physiological functions of the body remained unchanged. The overall picture of all these so called "mysterious performances" lead us to believe that by the constant practice of yogic exercises and meditation one can attain a full voluntary control over his autonomic nervous system. Through this acquisition one can easily exercise his control over the psychic functions and also over the functioning of the heart, lungs, liver, kidneys and other similar organs involved in the physiological and metabolic functions of the body.

Recently several such reports on transcendental meditation have come out to confirm the above observation from all over the world. Amongst them, most elaborative physiological studies that have been conducted in this field were by Wallace and his colleagues. These latter workers found significant metabolic and biochemical changes in persons practising transcendental meditation not only after the yogic practice, but also during the course of their meditative experience.

**Biofeedback studies**

Biofeedback can be defined as a study to record and realise the voluntary control of involuntary activities of the body by various methods. Although experts on Yoga have been developing these methods subjectively for many centuries, it is only recently that certain objective methods have been devised to record the realisation of voluntary control of autonomic nervous activities both in experimental animals and human beings. This is well known that we have full control over our muscular activities through the sensory and motor areas of the cerebral cortex. However, our knowledge with regard to sensory and motor pathways of autonomic nervous system is not very well understood. It seems that the limbic system and hypothalmic areas are the main centres from where the autonomic nervous system are continuously regulated without the interference with the motor and sensory areas of the cerebral cortex. It seems that just as the experts on Yoga, those who are trained in biofeedback system can learn to use the power of cerebral cortex over the Limbic and Hypothalamus leading to voluntary conrrol of various involuntary functions of the heart, blood pressure, respiration and even the various psychic functions of the brain. It looks now that it is not a supernatural mystic power of the brain that comes to a lucky few, but it can be learnt by anyone who is sincerely interested in the development of such a power and who constantly tries to practise it to attain that power. Therefore, it is not surprising to know that it is not only the human beings who can develop this power, but even the rats and cats can develop this power by repeated training and practice.

Thus Miller postulated that through constant practice one could learn to control internal organs and glands just as ane controls the skeletal muscles. In order to test these he and his colleagues paralysed the voluntary muscles of rats by curare and the introduced electrodes into pleasure centre of its brain. Then by stimulating this electrode they could stimulate the brain centre of pleasure and then some of them were rewarded for slowing down of their heart rate and others were rewarded for accelerating them. After some time some of these rats could produce even Yoga like action such as dilating the blood vessels of the Ear of oneside more than the other. From these one can say that the rats have learnt their voluntary control of autonomic nerves through biofeedback system. However, they found that those rats who accelerated their heart rate had become more excitable and contained more of certain neurotransmitters in their brain than others who slowed their heart. Then they repeated their experiments in cat's brain and found almost similar results.

Then a Japanese worker Kamiya studied this problem by using EEG on human beings. He wanted to see whether he could train the people to recognise these coming and goings of various rhythms in their brain starting with alpha rhythm. It is really surprising to know that through some practice one can correctly recognise the onset of alpha rhythm in the brain by a person himself. This means that the person has learnt to read his own brain or his mind. In fact he becomes aware of his internal state of mind and modify such a state at his own will. Such an alpha state means "calm, alert, relaxed and pleasant state". The Brain waves in the alpha wave range are 8 to 13 cycles per second. It is known that some people who are introspective normally produce large quantities of alpha waves, whereas others with excitable temperament produce very little. There is individual variations but by constant practice one should be able to change from brain wave patterns to alpha by yoga or zen meditation. This means that by meditations followed by the study of biofeedback system one can reshape his personality, improve his mental health and in fact can remake his new world. From all possibilities it is no exaggeration to say that yoga has now entered into a new phase of scientific study through which all the mysteries of yogic practice can be unravelled for the benefit of humanity at large.

Shapiro and his colleagues studied the clinical relevance in the use of biofeedback for the control of cardiovascular responses. They trained the subjects to increase or to decrease their systolic or diastolic pressures with Feedback and reward. They can achieve this by cortical control over the autonomic nervous system. Since in essential hypertension there is hyperactivity of the sympathetic nervous system activity, the biofeedback system might also keep us to reduce the blood pressure in these patients after a proper training. Thus Shapiro et al conclude "From the clinical point of view, evaluation of the therapeutic value of the biofeedback techniques for hypertension and other cardiovascular disorders needs to be established in carefully controlled studies. In our view biofeedback should be regarded not as a sole method of symptom control, but rather as an additional clinical Research Tool to be used in conjunction with other behavioural and medically-established techniques." From this one can say that though the utility of all these techniques are being established it would take some time before they can be used freely for therapeutic purposes.

### Transcendental Meditation

According to Bensen, the regular practice of this meditation was commonly associated with a decreased blood pressure in a number of hypertensive subjects. If however one stops the regular practice of meditation the blood pressure would return back to its original level within a period of 4 weeks or so. It is postulated that such a reduction of blood pressure after meditation might be due to activation of Integrated Hypothalamic response known as "Relaxation response." Thus Bensen et al state "The relaxation response is associated with decreased sympathetic nervous system activity and is hypothesized to be the counterpart of Cannon's Emergency reaction popularly called "the Fight or Flight response." However, such a hypothesis needs further confirmation. Thus all these relaxation procedures such as meditation, Hatha Yoga practice, Autogenic training, Zen meditation, Biofeedback system or hypnosis might be acting on the way through the hypothalamic system and hence they might be producing similar results in a greater or lesser intensity.

Thus EEG studies following transcendental meditation showed a characteristic increase in the alpha wave activity and the less common long trains of Theta activity. Similarly the EEG recordings showed that following transcendental meditation there is a decrease in the heart rate at least by 5 beats per minute. Similarly the oxygen consumption was found decreased in all the subjects within 5 minutes after the onset of meditation. Thus one could see about 20% of the decrease in the oxygen consumption when compared to control period. Skin resistance increased markedly at the onset of meditation with some rhythmical fluctuation during meditation. Thus Wallace states "The fact that tanscendental meditation is easily learned and produces significant physiological changes in both beginners and advanced students gives it certain advantages over other more austere Techniques. Physiologically the state produced by transcendental meditation seems to be distinct from commonly encountered states of consciousness, such as wakefulness, sleep and dreaming and from altered states of consciousness such as hypnosis and autosuggestion. Subjective reports coupled with the physiological measurements reported above suggest that this state might have application to clinical medicine".

On the basis of this, Benson and his colleagues clinically used the transcendental meditation technique on hypertensive cases and observed that it reduced the systolic and diastolic pressures in their hypertensive subjects after starting the regular practice of Meditation. Such a transcedental meditation advocated by Maharishi Mahesh Yogi in the West consist of the following :

(a) There is a constant mental stimulus of silently repeated secret mantras which are repeated throughout with eyes closed.

(b) One should try to concentrate his mind towards the repetition of his mantra and should not worry about the distracting thoughts that come to him periodically.

(c) While carrying out this meditation he should sit on a comfortable position with minimal muscular work.

(d) One is required to practise the technique twice a day for a period of twenty minutes each usually before breakfast and before dinner.

## METHODS OF YOGIC PRACTICE

As already stated a perfect Union of body, mind, and intellect can be attained and maintained throughout our life by means of Yogic practice. There are several methods of Yogic practice, some mainly dealing with the bodily health, whereas others dealing mainly with the mental and spiritual health. In our view for an integrated growth of both body and mind a person has to practise both the groups of Yogic practice. One of the best method of integrated approach to this problem has been described by Patanjali, which is widely accepted as the correct means of attaining our goal. It is called Aṣtanga-Yoga. They are as follows:

*(1) Abstention (Yama)*
*(2) Strict observance (Niyama)*
*(3) Easy postures (Āsana)*
*(4) Control of Braeth (Praṇāyāma)*
*(5) Withdrawl of senses (Pratyāhāra)*
*(6) Concentration (Dhāraṇā)*
*(7) Meditation (Dhyāna)*
*(8) Contemplation (Samādhi)*

Amongst these eight methods, the first two are mainly concerned with the person's behaviour towards outer world especially with regard to ethics and morality, The next three are mainly concerned with the regulation of activities of the bodily and sense organs. The last three methods mainly devote to the regulation and restraining the activities of mind. Thus by following these eight procedures of Yoga not only we can try to improve our relationship with the people of rest of the world, but also can improve the powers of our body, sense organs and mind in order to achieve the destined goal of our life.

### 1. YAMA OR ABSTENTION

Patanjali has described five methods by which one can practise abstentionism :

**I. Non-violence or "Ahimsa"**

This means that we should not produce any bodily or mental injury to anyone by our deeds or words. We must see that all the living beings are like us and we should not do anything, which we would not like others to do for us. We should try to do good to others, and we should try to have a company of good person's (Satsanga). Benefit from these good persons company is not so much for initiation, but for emulation. Further it is also argued that how could any one reach a high point of spiritual contemplation if his mind contains low and selfish thoughts ? Therefore, we should try to avoid all those emotional tendencies which would lead us to do more of physical or mental injury to others such as greed, anger, jealousy, animosity etc. Unless we practise to avoid these unwanted tendencies we can never achieve the goal of uplifting our spiritual strength.

**II. Truthfulness**

We should try to observe truthfulness not only in our talk, but also in our deeds and thoughts. While remaining truthful to ourselves and also to all others, we should try to speak "truth, the pleasant truth and should avoid as far as possible speaking unpleasant things even if they are true." Similarly we should never speak false things even in an indirect way to please others. Such a truthful talk and behaviour is one of the best means to cement friendship and gain confidence from all others. If any one breaks the rule of truthful behaviour at any time, he causes breach of confidence of the society which may subsequently lead to innumerable miseries and mental torture. Further, we should never live in a state of self-deception. We should always be realistic in our approach and accept whatever is the best under the available circumstances without uselessly complaining or wishing for higher things that are not readily available. Therefore, in order to have a complete peace of mind and attain success in our life, we should not only be truthful to the utmost in our dealings, but also to be realistic in our goals. These are some of the basic facts of truthful life and should be strictly followed to have a peaceful life.

### III. Non-stealing or "Asteya"

Under this heading, we should always remember that we should not have any desire to possess the materials which do not actually belong to us. Such a desire for possession usually leads to do evil things including stealing. In such a state, not only we use the things of other persons without their permission, but also we try to use them for different purposes than they are intended. It thus inclules misappropriation, breach of trust, mismanagement and misuse of other's properties. The person interested in following the principles of Yoga, usually reduces his requirements to the bare minimum without craving for wealth, power or physical enjoyment. Freedom from craving for the above makes the mind to remain in a state of tranquility. Not only we should refrain from craving for other's properties but also we should refrain from stealing at the intellectual level of other's ideas, speeches or writings. Whenever we want to borrow these things we should always make it a habit of acknowledging others ideas etc, so that we can avoid the chances of stealing even at the intellectual level.

### IV. "Brahmacharya" or celibacy

The actual meaning of Brahmacharya in Yogic literature is to refrain from all the activities related to sexual enjoyment. It is not only the actual bodily activity of sex that one should restrain but should also control the emotional and mental activity related to sex so that he gets a beneficiary effect of celibacy both at the bodily and mental level. It is stated that such an abstention from the use of sexual function leads in saving of much of bodily energy for a better use of carrying out various intellectual activity rather than spending it wastefully in the act of sex. Here celibacy does not mean that one should not marry at an appropriate age and have a normal married life. It only means that one should regulate his activity of the body and mind in such a way that one restricts the sexual activity to the bare minimum so that his energy so saved is fully utilised for the better purpose. Thus Aiyangar in his book "Light of Yoga" states that "when one is established in Brahmacharya he gets a full vitality and energy in the body, a courageous mind, and a powerful intellect so that he can fight any type of injustice. The Brahmachari uses the forces he generates wisely. He will utilise the physical ones for doing the work of the Lord, the mental one for the spread of culture and the intellectual one for the growth of spiritual life. Brahmacharya is the battery that sparks the torch of wisdom". From the above it becomes quite clear that the regulated and restricted activity of sex is the essential prerequisite for undergoing any type of training in the practice of yoga. It helps in maintaining not only of bodily vigour but also helps in maintaining an emotional tranquility and mental stability. Therefore, a properly regulated sexual life is an essential accompaniment of all the types of Yogic Practices and in the interest of deriving maximum benefit from it one will have to strictly follow these regimes by a constant practice.

### V. "Aparigraha" or free from desire for hoarding or collecting

By strictly observing the principles of Aparigraha, the person makes his life as simple as possible, both physically and mentally, with minimum requirements. Such a person with equanimity of mind develops a capacity to remain satisfied with whatever the materials are made available to him.

Therefore, he does not hoard or collect anything that does not need for his use immediately. He neither accepts anything in gratis without working for it nor he likes to receive any favour from anyone without rightfully deserving it. He feels accepting any such undue favour from any one indicates a lack of faith and poverty of spirit in himself. Therefore, the follower of Yoga adjusts the requirements of life in such a way that in any given circumstance he lives happily not only for himself, but also for others in the society by setting a good example of "simple living and high thinking." He gradually develops such a wisdom and equanimity of life that he does not want to keep anything for himself and utilises every thing that he gets for the welfare of the world.

## 2. NIYAMA

Here again 5 types of Niyama have been described by Patanjali : (i) Purity of body and mind, ( Ŝauca ), (ii) Contentment (Santoṣa), (iii) Tapas or austeritics, (iv) Study or Swādhyāya, (v) Dedication to Lord (Iśvara-praṇidhāna).

### I. Purity of body and mind (Shaucha)

In this category, one will have to practice purity in every sphere of his bodily and mental activity. In the bodily activity, he should remain clean externally by cleaning all the body orifices properly by taking daily bath, and wearing clean clothings, and also that he should take internally cleanly prepared food articles for a proper digestion and elimination. Here it is not so important as to what is the content of food; but whatever he takes, it should be clean and freshly prepared and should be good enough to provide required energy and promote positive health. It should be palatable yet simple, and should not be too much spicy or greezy. It is said that our temparament is moulded by the type of food we eat and therefore in order to have a sober outlook we should preferably become a vegetarian and should eat just enough to maintain all our activity without taxing our health. Too much or too little of eating is harmful to the body thereby to the mind also.

In addition we should also maintain a purity of mind. Since it is easily disturbed by exposing ourselves to passion, anger, greed, delusion, pride and jealousy, we should try to avoid them to the best of our abilities. By constantly practising a control on these emotional disturbances, we should be able to maintain relatively a clean mind. Still more important is the cleaning of intellect which can be carried out by conducting useful studies which would give us correct wisdom. By cleaning the body, mind and intellect we can easily direct all our attention to concentration and meditation. Therefore, it should be our constant effort to see that all body, mind and intellect are constantly kept neat and clean by the methods described above to fulfil the aims and objectives of our life.

### II. Santosa (Contentment)

Here contentment means tranquility of mind in whatever the circumstances one is placed in. Thus the person makes every effor to make best use of the materials available for attaining all the success without making any complaints or grousing. We should, as far as feasible, gladly accept the things and the people as they are and not wishing thus to be different. In that event it would enable us to live in the society without much antagonism from others and we can derive maximum pleasure from each moment's opportunity.

Such a contentment has to be cultivated. A mind which is not in a state of contentment cannot concentrate and meditate. Discontentment is the root cause of all the misery and it constantly causes conscious or unconscious conflicts in our mind. Hence, it should always be avoided in the interest of attaining bliss.

**III. Tapas or practice of austerity**

By following strict regime with austerity in our daily life with regard to food, exercise, rest and recreation we can attain our goal of life without much difficulty. It mainly involves a constant practice of self-descipline and austerity. By following Tapas or austerity in every thing that we do through the body, mind and intellect a person gradually gains courage and wisdom and develops integrity and straightforwardness in his character.

The practice of such an austerity or restraint has to be done with regard to every day's food and drinks, living conditions, and in fact in every aspect of our physical and mental activity. Therefore, we should practise everything with utmost modesty, simplicity and purity. It is this which would ultimately make us happy, healthy and wise. In this connection Swami Chinmayananda while commenting on Gita says : "Tapas is a practice of self-denial so that the energies that are dissipated through indulgence are conserved and they are intelligently redirected to win the ampler fields of spiritual unfoldment. Tapas is therefore a plan which consists of (i) conservation of all energies wasted meaning thereby an economisation of the expenditure of energy, (ii) preservation of energy so saved, (iii) re-direction and re-employing this new found energies in the constructive fields of self-unfoldment. Those who don't live an austere life, who do not have any control over their body and mind, who have dissipated their physical and mental energies in the wrong direction become impotent bodily, mentally and intellectually. To them it (Yoga) will not be beneficial." From these statements it becomes clear how important and beneficial it is to practice tapas in order to achieve the goal of our life.

**IV. Svadhyaya or study**

Study will bring out the best that is within us after studying the book of our own choice and after writing our own thoughts or books. A study of great thoughts of others carefully preserved in their books would help us immensely in our understanding the nature of things in existence within ourselves and also present in the outside world. Therefore, in order to make our life healthy, happy and peaceful it is essential to study regularly all the relevant literature on the subject. Such a study of books on the topics of our chosen path will enable us to concentrate upon the solution of difficult problems of life when they arise. It will put an end to our ignorance and help us to acquire new knowledge. It is through knowledge only one can plan intelligently his future activities to achieve his goal and therefore self-study of sacred treasuries of well known teachers is the essential pre-requisite before we can make any progress in any direction of our life.

**V. Dedication to God or Isvara-pranidhana**

We have to dedicate all our actions and the fruits of our actions to God everyday in order to express gratitude toward Him. Development of such a humility in one's mind in the form of "Bhakti" or adoration will greatly help us to forget the selfish motive of "I" or "mine" and pray for universal good. When the mind becomes free from desire of personal gratification and is filled with the ideal of doing good to all, then we remember God to help us to fulfil our mission. Thus Aiyangar states "Actions mirror a man's personality better than his words. The Yogi has learnt the art of dedicating all his action to the Lord and so they reflect the divinity within him." As Swami Chinmayananda observes in Geeta: "Recognise the God as one who dwells in the "heart" of every one–meaning thereby in the mental bosom of one who has cultivated the divine qualities of a cultured human being such as love, kindness, patience, cheer, affection, tenderness, forgiveness, charity etc." the Lord gives power for all the living creatures to act on. He energises every one. Everything revolves around him." Therefore, we should surrender our ego unto the Lord by developing a devoted attitude of dedication. Thus it requires all of us to live and act with our hearts dedicated to consciousness which is constantly pulsating with the presence of divinity in all, the plans of our existence. Unless we develop such an attitude of dedication in life we will never be able to concentrate and achieve the goal of our life. These are some of the methods of Yama and Niyama which are the pre-requisites for other yogic practice.

## 3. ASANAS OR POSTURES

Asanas or Postures connote a large number of different postures by the practise of which everyday, one can hope to get not only a steadiness in bodily health, but also attain a tranquility of the mind. Whereas the practice of physical exercises gives strength mostly to the limb muscles, the practice of yogic postures increase the strength and vitality of all the muscles of the trunk and also of all the internal organs. The overall result of practices of these postures everyday will lead to maintenance of a good elastic body built and the postponement of the aging process. Here one should remember that the aging is an inevitable process one must pass through from childhood to youth, and from adulthood to old age; but what Asanas or Postures do is to enable us to delay the onset of these aging processes by maintaining a good microcirculation and thereby improving functions of all the bodily system and organs. Thus one of the important physiological phenomenon that takes place following asanas is that there is an increase in the circulatory efficiency of various vital organs such as brain, lungs, heart, liver, kidney, all the endocrines and other similar organs and tissues. This naturally leads to increased oxygen uptake and metabolic turnover of their secretory products which naturally improve all the functions of the body. Further they also help us to maintain a good elasticity of the blood vessels supplying to these vital organs like that of heart or brain, which are often effected by the modern disorders of stress and strain.

Another advantage of doing these asanas, in contrast to physical exercise, is that they do not need much space or equipments. They need some airy space and determination of the performer to do these postures everyday without fail, wherever he is living under whatever the circumstances. It is the regularity of performing these yogic asanas, that enable one to improve and maintain agility, endurance and vitality of his body throughout his life.

Such yogic asanas are usually done in the morning, after moving the bowels and before taking the breakfast. However, they can be practiced even in the evening time under similar conditions. They should be practised in airy, well ventilated and clean place. While practising one should wear minimum of clothes to avoid pressure by the tightly fitting clothes.

The following are some of the common asanas which are usually practised by everyone and hence a brief technique of their practice are given along with figures. However, it is advisable that these techniques are actually learnt from some teachers who have been well trained in their practice so that we may not indulge in doing them by wrong methods. Therefore, we are giving only the guidelines for doing some of the important asanas which every common man working in different fields can practise with great benefit. Those who want to learn more about them in depth may refer to some of the standard books on yogic exercises.

### (I) Sarvangasana or posture for all the limbs and organs (Fig. 8)

This is done at first by lying flat on the back and then raising the legs and back until one is standing on the shoulders. For maintaining this posture steadily one must support the back above the waist with hands while the elbow and arms remain on the ground to take a part of the body weight (See Fig. 8). The chin is kept against the chest and the legs are kept vertical. At first posture is kept for a minute or so and after practice we may increase the duration upto 5 to 10 minutes depending upon the need and capacity, According to Aiyangar, this is one of the important "asanas" which strives to produce harmony and happiness of a person by producing changes in the entire body. It improves the functioning of endocrine glands especially of the thyroid and parathyroids, by improving circulation in the neck. We have confirmed these observations biochemically in a group of volunteers. In these persons after 6 months of practice of Sarvangasana and other related asanas, the serum protein bound iodine (PBI) (which indicates thyroid function) was found raised from 4.5 Mcg to 6.2 Mcg, Usually if the thyroid and other endocrine glands fail to function properly, there is a depression of metabolism leading to early degeneration and decay of all the body systems causing premature ageing. In addition, by following this posture there is also improvement in the venous return of blood from the lower limbs and abdominal viscera into the heart, which would ultimately improve the functioning of these organs. Thus one can see a notable improvement in the functioning of the alimentary canal leading to good appetite and regular bowel movements. Since this posture promotes the circulatory efficiency of the heart, lungs and brain by gravity, one should expect to get improvement in the functioning of these vital organs also as was observed by us in the volunteers after six months of practice of Sarvangasana. Thus it is one of the basic asanas which should be practised by everyone to get good results.

### (II) Matsyasana or fish posture (Fig. 8)

This Asana can be performed in lying down position by starting with the sitting position with legs folded as is done in Padmasana or Lotus posture (see later). After this the person lies down on the ground in such a way that only the head and buttucks touch the ground and the back remains in the form of arch, With the hands one touches the toes and takes a regular deep breathing in this posture from one to three minutes. This is an asana, which is stated to improve function of all the abdominal viscera and also cardio-respiratory system. It may also held the functioning of thyroid gland by draining its blood efficiently. This posture is usually practised just after doing the Sarvangasana.

### (III) Paschimottanasana or back raising posture

In this posture at first the person lies flat on the ground and then raises his upper part of the body gradually in such a way that it touches the outstretched legs, without bending at the knees and the face is kept between the knees. This position may be held for a period of one to three minutes and it helps to give strength to the abdominal muscles and squeezes out any gas accumulated in the lower part of the bowel. It also improves the power of back muscles and of the ligaments connecting the vertebral column. Because of this, it may also help the functioning of the spinal cord by improving its circulatory efficiency. (Fig. 8)

### (IV) Halasan of plough posture

In this posture at first the person lies on the back, then raises the legs and back and then swings over the legs in such a way that toes of his legs touch the ground over his head. Thereafter the arms remain straight along the ground. During this procedure knees and legs should be kept straight and tight, Such a posture should be attained gradually in older people to avoid strain on the neck muscles and usually this posture can be maintained for one to five minutes. This posture apart from giving exercise to the spine, also greatly helps to improve the function of the gastro-intestinal canal. Frequently the gaseous distention of the colon is evacuated during the performance of this procedure and it thus gives much relief to the people on the spot (Fig. 8).

### (V) Bhujangasana (Cobra Posture)

In this Asana, the person lies down on the floor with face down or prone position. Then he lifts his upper half of the body above the navel by supporting it with outstretched hand, forearm and arm. Then he throws back and stretches the head, neck and trunk in such a way that the posture looks like a serpent in rage. This posture is maintained conveniently for one to two minutes and it greately helps in removing pain due to spinal injuries or due to displacement of spinal discs in the entire spine. It gives additional strength to the spinal muscles and also helps in expanding the chest. (Fig. 9)

### (VI) Shalabhasana

In this Asana the person lies on the prone or face down position and tries to lift his legs up without bending the knee. At the same time the upper part of the body including the chin is on the ground and the arms are kept extended by the side of the body to give full support to body weight. Thereafter one tries to raise the head and shoulders and throws them backwards as much as possible by extending the neck. It is somewhat difficult to attain this position in the initial period of training; but by practising to raise one leg at a time one can gradually attain the perfection in due course of time. Normally this position should be maintained for a period of one minute for giving full strength to spinal muscles, and ligaments of vertebral column. It is also good for giving strength to abdominal muscles especially for the middle aged persons of both the sexes. (Fig. 9)

### (VII) Ardha Matsyendrasana

For doing this Asana effectively, one will have to sit up and place the left heel in the perineum. The right foot is brought over the left leg near the knee and with the right knee raised and the foot on the ground and the right knee is brought down to the left axilla (arm pit). Now twist the spine in such a way to the right side that the face and shoulder remain in the same alignement. The right arm goes around the back with the hand holding the left thigh. If needed this can be repeated on either side so that one can get the benefit on both sides. It is stated that this asana not only helps in emptying the bowel content but also helps in giving strength to the bladder muscles and also relieves congestion of the perinium including that of prostate. (Fig. 10)

### (VIII) Mayurasana or Peacock posture (Fig, 9)

In this posture, the person initially lies on the floor in the face down position and then raises the trunk to bring it into a kneeling posture. Then one bends forward and put both the palms and fingers together on the

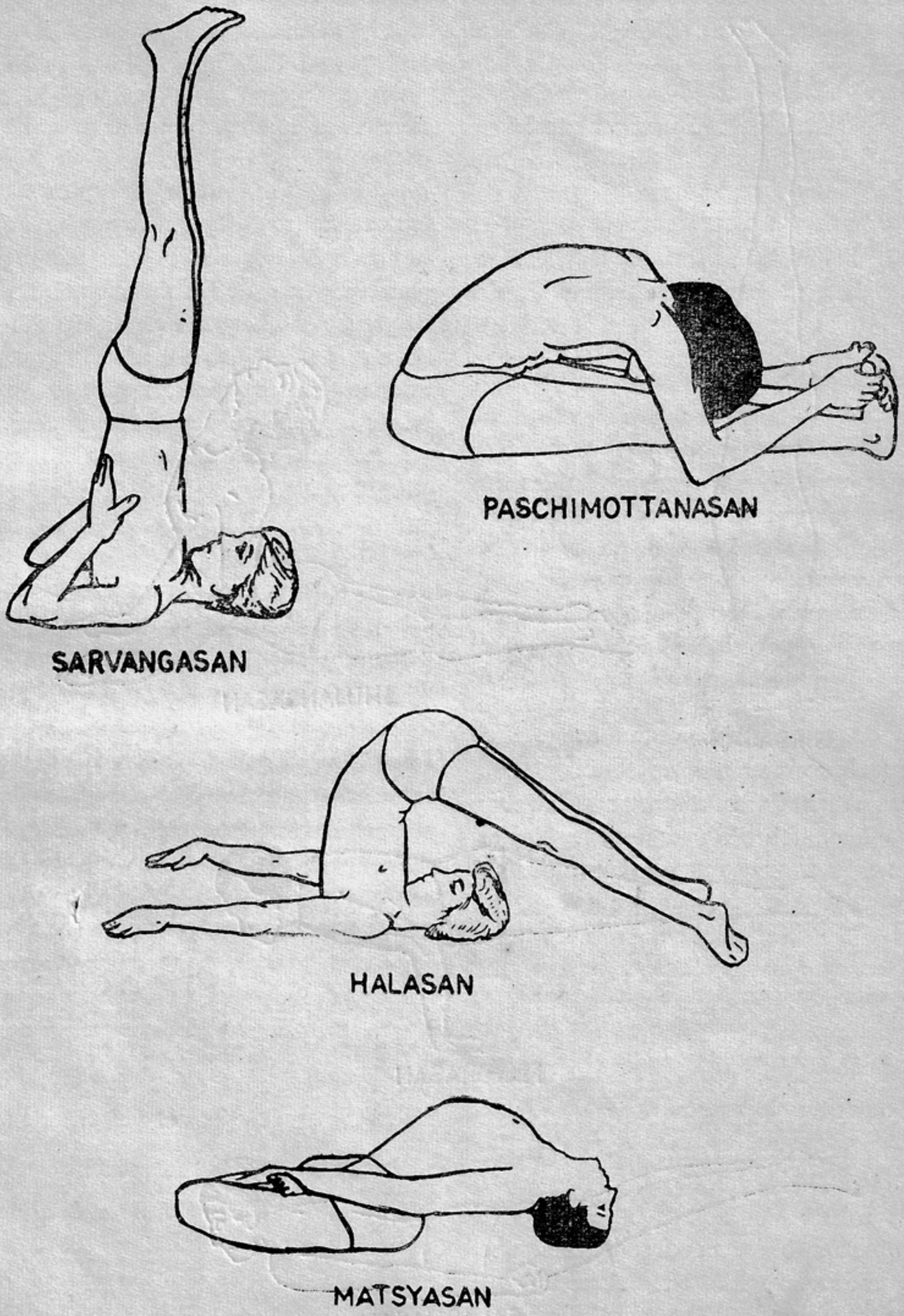
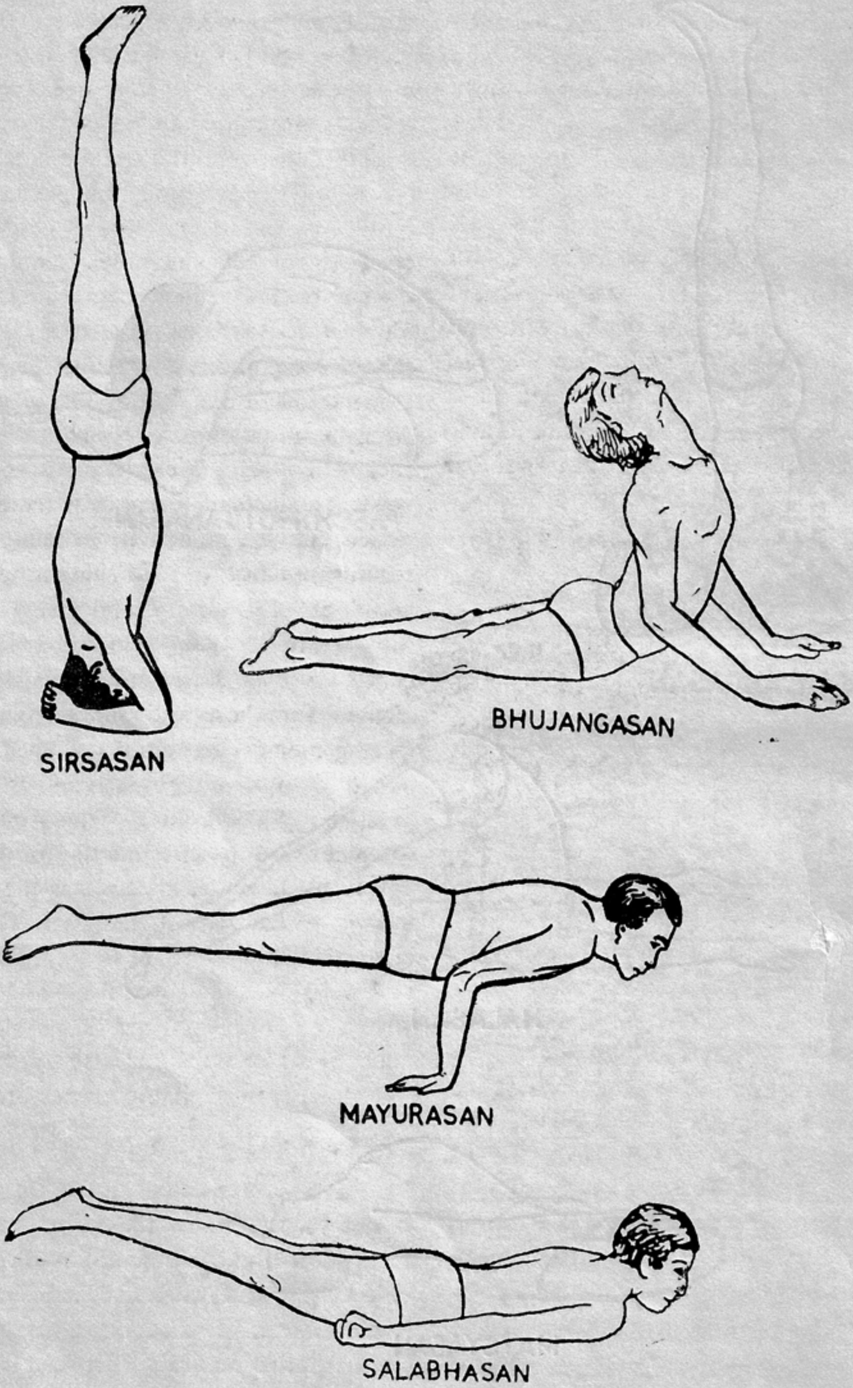

PASCHIMOTTANASAN
SARVANGASAN
HALASAN
MATSYASAN

Fig. 8 : Four Common Asanas practiced routinely.



SIRSASAN

BHUJANGASAN

MAYURASAN

SALABHASAN

Fig. 9 : Additional four Asanas.

floor facing towards the feet. Then he bends the elbows and keeps the forearms together. Then he keeps the legs stiff and straight and the head in the position of looking forward. Then he balances the entire body on the elbows parallel with the ground. This position can be maintained from few seconds to two minutes and it usually gives strength not only to the abdominal muscles, but also gives strength to the smooth muscles of the gastro-intestinal canal leading to improvement in appetite and digestion. It is generally stated that persons suffering from diabetes may find it useful to lowering their blood sugar. In addition it also strengthens the muscles of forearm, wrist and elbow joints.

### (IX) Dhanurasana or the bow posture (Fig. 10)

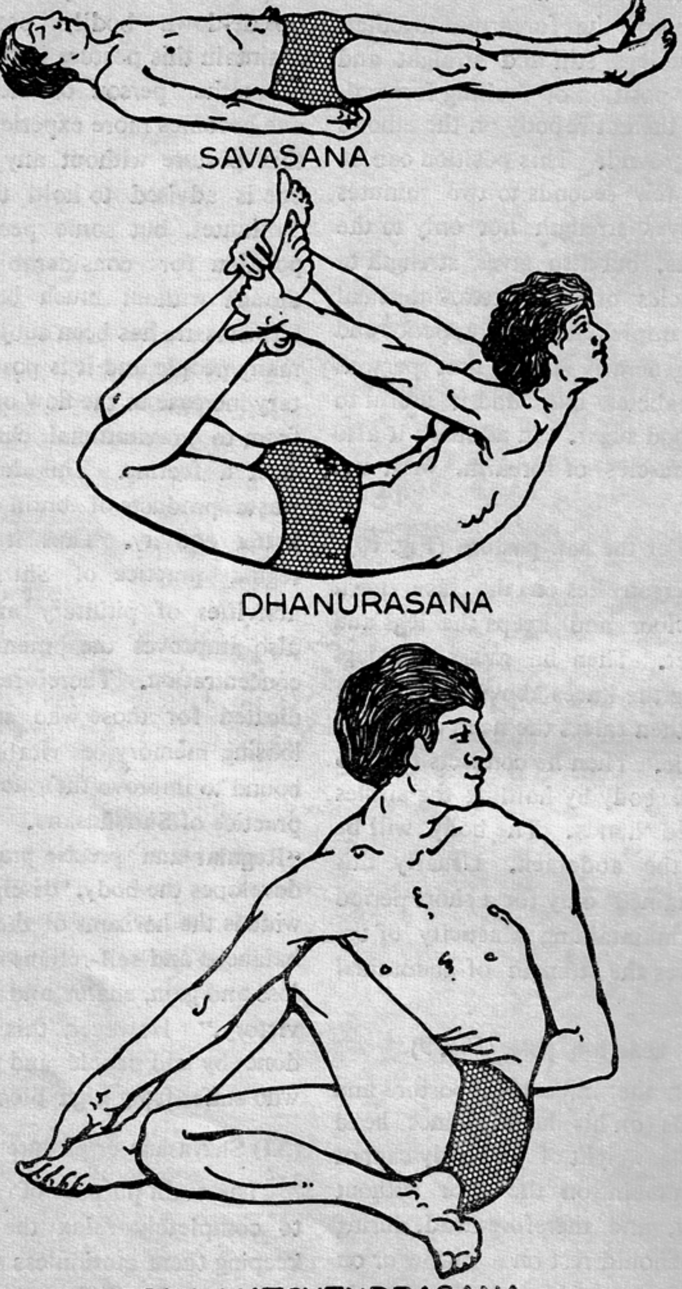
In this the person lies on the face down position on the floor and keeps the legs and feet close together. Then he raises the legs together by raising the knees above the floor on the one side and then raises the head and chest from the other side. Then he connects the two raised parts of the body by holding the ankles by his outstretched hands. The body will be lying mostly on the abdomen. Usually this posture can be retained only for a short period and it helps in maintaining elasticity of the spine and improves the strength of abdominal muscles.

### (X) Shirsasana or head low pose (Fig. 9)

This is one of the important posture and in this one stands on his head. Since head carrying the whole weight of the body cannot be allowed to remain on the floor without much discomfort, and therefore head, during the performance, should rest on a pillow or on the interlocked fingers of his own hands. In order to do this posture at first one kneels down on the floor, and then bends forward to put the head and forearm on the ground. Thus he gradually lifts up his legs and trunk in on upside-down bodily position. He tries to maintain this posture initially with the support of another person or the wall. However, as one becomes more experienced he can maintain this posture without any support. Normally one is advised to hold this posture for about 5 minutes, but some people hold on to this position for considerable amount of time, though without much benefit. The effect of Shirshasana has been subjectively observed by many people and it is possibly due to momentary increase in the flow of blood to the brain from to gravitational changes that results in such a feeling. This helps to get over the waste products of brain cells leading to their better activity. Thus it is stated that the regular practice of Shirshasana improves the activities of pituitary and pineal glands and also improves the memory and power of concentration. Therefore, it is specially indicated for those who suffer from insomnia, loosing memory or vitality. Such people are bound to improve their activities by the regular practice of Shirshasana. Thus Aiyangar says: "Regular and precise practice of Shirshasana developes the body, disciplines the mind, and widens the horizons of the spirit. One becomes balanced and self-reliant in pain and pleasure, loss and gain, shame and fame and defeat and victory." However, this asana should not be done by old people and also by those people who suffer from high blood pressure.

### (XI) Shavasana or posture of dead body (Fig. 10)

The main purpose of doing this exercise is to completely relax the body and mind by keeping them motionless and still. Though it looks easy, but difficult to practice unless one is fully conversant with the procedure. This asana is also done in between doing other asanas to reach a stage of relaxation after



SAVASANA

DHANURASANA

ARDHA MATSYENDRASANA

Fig. 10 : Asanas commonly practiced.

completing one type of asanas. This avoids feeling of tireness and makes the entire procedure a pleasurable one.

In this asana, one lies down on the floor fully relaxed and then starts making special efforts to reach a stage of relaxation of toes, lower extrimity, hands and arms, then trunk, neck and head, respectively. Simultaneously with this, one should also relax the mind through controlling emotions and thoughts. Such a posture can be continued from 5 to 15 minutes and it gives complete relaxation both to the body and mind and makes a person very much refreshed to carry on any physical or mental work. Recently quite a lot of work has been done in this field and they have prescribed specially for patients with high blood pressure and different disorders of the heart such as Angina or coronary insufficiency. Because, these patients cannot withstand more strenuous yogic practice, This is one of the easiest and most suited posture for these patients to get the full benefit of yogic practice provided it is practiced regularly under proper guidance.

## SURYA NAMASKARA OR SALUTATION TO SUN

Though the Surya Namaskar is not included in the regular yogic practices, it has been invariably practised along with yogic postures. Thus Satyananda says : "Surya Namaskar is a dynamic exercise. It is not an asana or a part of the traditional yoga. We always recommend practitioners to include it as an essential and integral part of their yoga programme. It revitalises the whole body, removes all signs of sleep and is excellent for preparing the whole body and mind so that the maximum benefits can be derived from the subsequent Asanas, Pranayama and Meditational practices."

### Technique

There are twelve physical postures in this procedure which should be done in sequence one after other. It can be synchronised with breathing exercise to improve its efficacy and beneficial effects (Fig. 11).

POSITION 1.—Prayer pose : Stand erect with feet together palms together infront of the chest in an attitude of prayer.

POSITION 2.—Raise the arm above the head and bend the arms back and head backwards. Along with this take a deep inspiration.

POSITION 3.—Bend forward and place the palm of the hand on the floor and try to touch your knees with chin, during this posture exhale the air.

POSITION 4.—Extend the right leg backwards as far as one can, and bend the left leg at the knee joint. The hand should remain on the floor, and arms should remain straight. Then bend the back neck and head backwards as much as one can. While doing so take a deep inspiration.

POSITION 5.—Extend the left leg backwards to keep it parallel with the right leg. Raise the hip as much as one can and then lower the head so that it remains in between the two arms. Hold the breath during this period.

POSITION 6.—Bend the arms and lower the head and chest towards the ground. But raise the abdomen and hip above the floor and the knees in contact with the floor. During this period, have a deep expiration.

POSITION 7.—In this position lower the hip to the floor, and then make an arch of the trunk neck and head, along with straightening of the arms. This position is also known as Bhujangasan or Cobra pose. During this period take a deep inspiration.

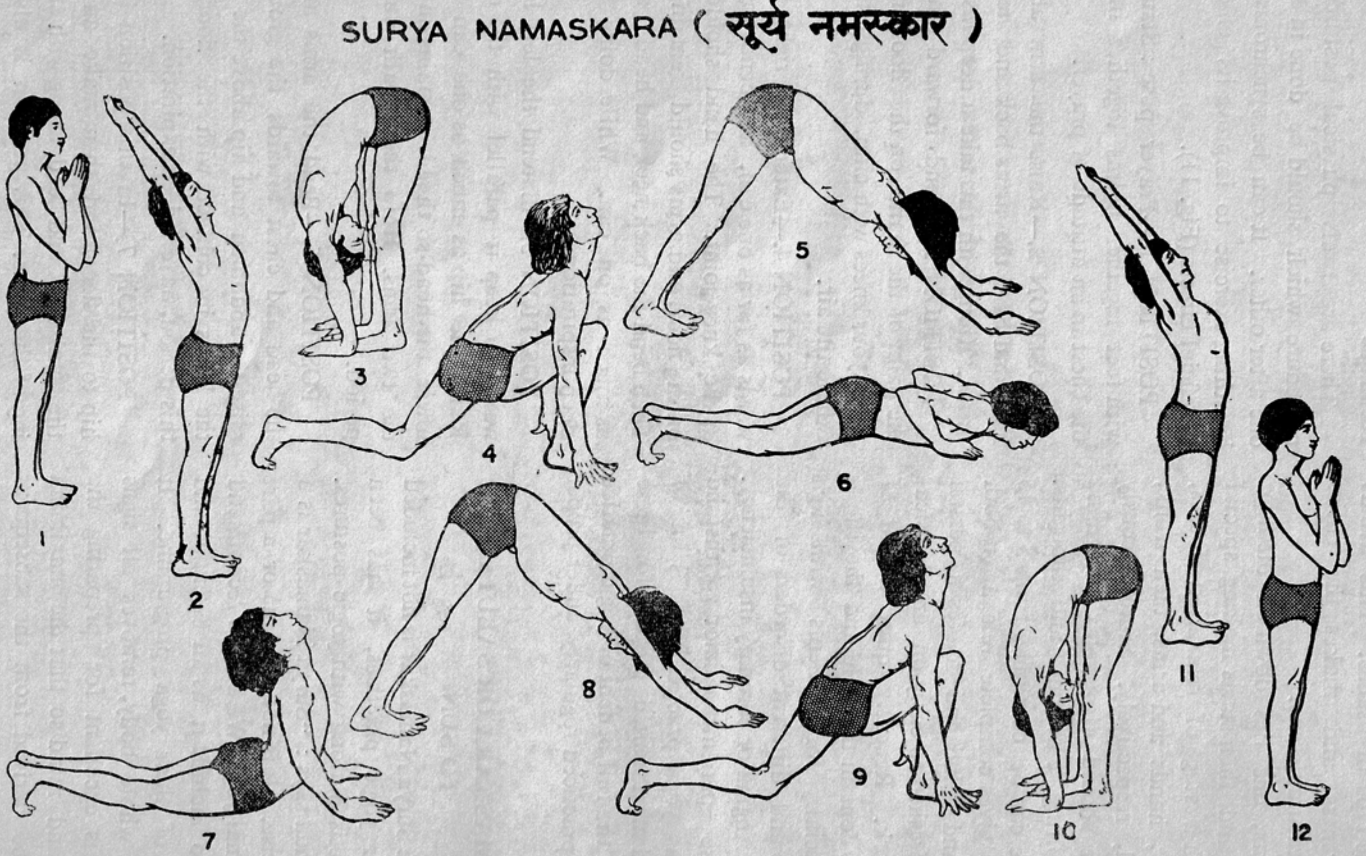

SURYA NAMASKARA ( सूर्य नमस्कार )
1
2
3
4
5
6
7
8
9
10
11
12

Fig. 11 : The twelve postures, stepwise undertaken in Surya Namaskar. This procedure is repeated along with breathing regulation 5 to 10 times depending upon the physical capacity of the person.

POSITION 8.—In this one should repeat the position 5 and keep the arms and legs straight and exhale the air.

POSITION 9.—During this period repeat the position 4 excepting that in this posture instead of bending left leg, right leg is bent and the other leg remains straight. During this period deep inspiration is taken.

POSITION 10.—This position is the same as seen in position 3, such as lower the head towards the ground and exhale the air deeply.

POSITION 11.—This position is just as No. 2 and bend the head, trunk and arm backwards, while taking deep inspiration.

POSITION 12.—This is the final position which is the same as No. 1, and relax the whole body while exhaling the breath deeply.

Normally the entire Surya Namaskar should be repeated about 10 times depending upon the physical capacity of the individuals. Further one should do the whole Surya Namaskar, with relative ease and comfort and no strenuous exertion should be done to achieve the goal. It should be done rhythmically in a sequence while controlling the breath properly as mentioned. One should do it only that much time which one can conveniently perform without exhaustion. Average people usually do it 10 times in about 5 minutes, but the time and number should be left entirely to the convenience of each individual performer's physical capacity. The best time to do the practice is in the morning facing the raising sun. However, this may not always be possible, and hence it should be practised in the airy room early in the morning in an empty stomach-as an adjunct to the regular yogic practice. During this practice one should wear as little clothing as possible so that one can conveniently do the practice without any hindrance by the tightly fitting clothes. This can be practised by man and woman of any age. But it should be avoided by women during menstruation or pregnancy. Thus Swami Satyananda says in a recent Kriya Yoga : "Surya Namaskara is a panacea for those people who live in cities and towns and and who find insufficient time and opportunity to take adequate exercise".

"It is urban people who suffer from the majority of stress disaeses. The main reason is the lack of exercise and peace of mind. Surya Namaskara is the answer, especially if done in conjunction with other yoga practices ......So needless to say, we highly recommend that you practise Surya Namaskara".

## 4. PRĀNAYAMA OR BREATHING PRACTICE

Pranayama or breathing practice mainly consists of inhalation of air by deep inspiration, holding of breath as long as it is possible and then exhalation of air by a deep expiration. Such a practice of breathing exercise everyday not only improves the cardiorespiratory function, but also helps one to set up in due course of time, a new habit of breathing practice. It had also been observed that following a regular practice of pranayama one gets a feeling of calmness of mind as a result of excess of oxygen to the brain cells. This state of mind will ultimately help to concentrate and meditate which is the ultimate aim of yogic practice. Such Pranayama is usually done just after asanas and just before the person proposes to do meditation. In fact, Pranayama apart from helping one to get a good bodily health through improvement in the cardiorespiratory function, is a preparatory procedure for enabling one to attain his goal through meditation.

In actual practice of breathing exercises, there are three divisions, inspiration (Pooraka), holding of the breath (Kumbhaka) and expiration (Rechaka). According to some authors there is a time limit and ratio amongst these three procedures. Thus inspiration should take 2 seconds, the breath holding should last 8 seconds and the expiration should take 4 seconds, having a ratio of 1 : 4 : 2 in this whole procedure.

Such a regular, time bound breathing habit would be of much value for undertaking a more difficult task of concentration of mind and meditation. On the other hand if it is done badly it may produce its harmful effects. In fact if one wants to undertake this, he should proceed slowly and carefully, and not to mix it up with any emotional excitement or disturbance. If one does not take such precaution he, instead of getting relief, may get various diseases, such as dyspnoea, cough, headache or similar other diseases. It would be better if one learns the techniques of pranayama through some teacher who is well versed in it so that one does not practice in an incorrect way. If it is done correctly and everyday it leads to steadiness, lightness, and sensitiveness of the body to face any situation at any time.

**Technique**

Normally the Prānayama should be done in the morning after evacuating the bladder and bowel. It should be done in a clean and well ventilated place and sitting on the floor on a comfortable posture such as that of padmasana. The person should sit at ease—without any tension or discomfort with his arms and legs fully relaxed. The neck should be kept erect, and the head should face straight forward with the eyes closed. The right nostril is regulated by the right thumb and through the tips of middle and ring fingers the left nostril is closed. At first one takes a deep breath of inspiration which may last for 2 seconds through the left nostril while at the same time closing the right nostril through the thumb. Such a regulated air entry at the nostril is further regulated by closing the vocal cords as much as possible so that the air entry to the lung is fully controlled and regulated and one inhales the air in steady and constant pressure. Such a breath is held for atleast 8 seconds and then exaled out through the right nostril after closing the left nostril slowly and gently. This should take 4 seconds. Then he inhales the air through the right nostril in the same way as described earlier and then retains it atleast upto 8 seconds. He then breaths out gently and very slowly through the left nostril. (Fig. 12). If one practices such breathing exercises twenty times in a day it would soon produce considerable improvement both the bodily and mental health. His look becomes cheerful and he gradually develops much enthusiasm, courage and strength to do any type of work that is entrusted to him. This is

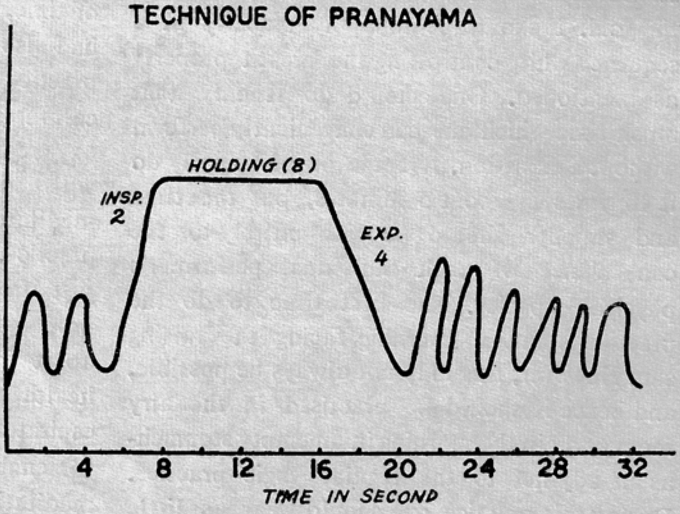


Fig. 12 : Technique of Pranayama shown graphically

the main type of Pranayama, but there are many variations in the technique of breathing exercise, which will have to be learnt from experienced teachers. Therefore, they will not be dealt here. Those who are interested in these procedures may refer to larger volumes on the subject.

### 5. PRATYAHARA OR CONTROL OF SENSE ORGANS

After completing the discussion on all the bodily exercises we now proceed to the discussion on the control of the mental processes. Because, it is a well known fact that the mind greatly influences the bodily functions, especially when it is disturbed. Therefore, every effort should be made to control the mind voluntarily in order to prevent its harmful effects on the body.

This can be mainly achieved by restraining the activities of the sense organs which are the main gate keepers of our mind and body. If we could control the entry at the gate, in the form of minimising the chances of stimulating these sense organs, one should be able to reduce the hectic activities of the mind, and thereby the body. This can possibly be done by two methods. Either one goes and lives in a secluded place such as in the Hills of Himalayas or one trains his sense organs in such a way that even if he stays in the busy streets of Bombay, London or Newyork his sense organs do not perceive anything excepting what he exactly wants to perceive. Whereas going and residing in hill stations cannot always be practiced excepting during vacations, one should still try to get a quite and calm atmosphere as far as possible of the place of his work and residence so that a minimum of disturbance comes to his sense organs. However, in the majority of modern urban life this may not be feasible. Hence we should lay greater emphasis on the practice of restraining the sense organs.

The persons with unrestrained sense organs for example are never satisfied with whatever the material comforts they already have to live or to eat. This situation is commonly seen in the families of affluent society throughout the world. They are always restless and are never satisfied with what they have. They always want to get more and more wealth to enjoy more and more comfort. Even thereafter their restlessness still continues due to the fact that they have never learnt the technique of restraining their sense organs through the yogic practice of Pratyahara. Now, let us go to the other extreme and carefully watch some of the Saints or Sadhus living in the ghats of river ganges at Banaras or other similar holy places. Many a times these people have completely renunciated the comforts and live with minimum of comforts to survive and minimum to eat so as to sustain their life. Yet they are always found happy and contended.

But, for an average working man the truth lies somehere in between. He has to restrain his sense organs as best as he can and then lead as simpler a life as feasible within the best possible circumstances. In spite of difficulties and shortcomings, these persons practicing restrain (pratyahara) remain much more happy and satisfied than the rich man who inspite of having all the comforts, still remains dissatisfied with life. Only way to make everyone happy and comfortable is through pratyahara, the practice of which every day, under whatever the difficult situations one can attain his goal. After all happiness is a psychological process and it is through constant practice that the mind becomes slave to the body and remains as such under its full control.

It is really very hard to control the mind. However by a constant practice with a definite goal everyday for a certain period one can restrain one's mind and the desires of sense organs to a considerable extent. In this connection Vivekananda says "The human mind is like that of a monkey incessantly active by its own nature; then it becomes drunk with the wine of desire, thus increasing its turbulance. After the desire takes possession, then comes the sting of scorpion of jealousy at the success of others, and last of all the sense of pride enters the mind, making it think itself of importance. How hard to control such a mind."

Vivekananda further continues "the first lesson there is to sit for some time and let the mind move on—the mind is bubling up all the time. Give it the rein. Many hideous thoughts may come into it. But you will find that each day mind's vagaries are becoming less violent, that each day it is becoming calmer. In the first few months you will find that your mind will have a great many thoughts; later you will find that they have somewhat decreased and in a few more months they will be fewer and fewer until at last the mind will be under perfect control, but we must patiently practice everyday. It is a tremendous work not to be done in a day. Only after a patient, continuous struggle for years can we succeed." From the above it becomes clear that the voluntary control of sense organs and thereby the mind, through constant practice through years together, is the essential prerequisite for attaining success in the remaining parts of yogic practice.

## (6) DHARANA OR CONCENTRATION

After one has succeeded in practicing Pratyahara, one tries to acquire the experience of Dharana, or the power of concentration. In this, one practices to hold the mind on certain point such as a part of the body like middle of forehead or certain flower or any article that he likes the most. Then he tries to pin point his mind to that area or article whenever he can concentrate his mind. For this he should try to practice it whenever he is alone; further he should not speak much which would distract his mind to other matters. Such a devotion to the power of concentration on any point of one's choice everyday will help much to calm down one's mental excitement and will induce calmness and serenity in the mind. In this connection Vivekananda discribes the techniques of Dharana so well that it is worth to reproduce it in full. Thus he says "First hear, then understand, and then leaving all distractions close your mind to outside influence and devote yourselves to developing the truth within you. Take one thing up and do it and see the end of it and before you have seen the end do not give it up. He who can become mad with an idea, he alone sees light. Take up one idea. Make that one idea your life, think of it, dream of it, live on that idea. Let the brain, muscles, nerves, every part of your body be full of that idea and just leave every other idea alone. This is the way to success and this is the way great spiritual gaints are produced. To succeed you must have tremendous perseverance and tremendous will. "I will drink the ocean", says the perserving soul, "at my will mountains will crumble up,' Have that sort of energy, that sort of will, work hard and you will reach the goal."

Vivekananda's these exhortations while discussing Dharana are full of enthusiastic statements which every one should make note of and remember it while practicing this type of yogic practice. As far as possible, those who want to practice concentration, should not waste their energy here and there with extraneous matters, should not mix up with too many people and should not have too many distracting engagements which they could easily avoid. They should devote everyday as much time as possible to concentrate on one object or idea with definite goal of achievement. Then he strives hard regularly and continuously till he achieves the desired goal. Earlier one trains his mind in this direction, better for him to achieve bigger and greater aim of life till he really becomes an intellectual gaint. This is basic and elementary secret of all the persons who achieved great many things in their life time and hence everyone must practice to develop the power of concentration and maintain it throughout his life.

## (7) DHYANA AND (8) SAMADHI (MEDITATION AND SUPERCONSCIOUS STATE)

Since the writer has not much experience in these final stages of yoga he has taken the liberty of summarising the views of other experts, especially from the writings of Vivekananda and it will take some time for him to give further details on these topics based on his own personal experience.

In a living state of our life, the certain functions of our body are done with our consciousness, such as seeing the pictures, listening to music, eating the sweets, smelling the scent or touching our nose with a hand. However, on the other hand beating of the heart, digesting our food, or absorption of oxygen from the lungs occur unconsciously without our knowledge. However, it has been observed by yogic experts that, by practice men can even bring the heart beat under their control. Likewise they say that every function of the body can be brought under our control by constant practice. The main technique by which this can be brought about is through the understanding that all the bodily functions which occur without our outward consciousness are also performed by us unconsciously. Thus there are two planes in which bodily functions occur, (a) conscious plane (b) unconscious plane, Yet there can be one more plane, which is higher than both these planes—when mind goes beyond self consciousness and it is called superconsciousness or Samadhi. When a man goes into deep sleep, he enters the plane beneath the consciousness. His bodily function of breathing and beating of heart occur spontaneously, but when he wakes up and he again gains his consciousness he becomes the same person. But when a person attains Samadhi and attains superconsciousness and then returns to his consciousness state, he becomes a different man with greater knowledge and wisdom. How can this be brought about and how can one attain his goal ?

It cannot be achieved all of a sudden nor one can jump to it accidentally. One will have to go step by step as already mentioned from Yama to the level of Dhyana and then only he can reach the stage of Samadhi or superconscious state. In this connection Swami Vivekananda says "We may talk and live all our lives, but we shall not understand a word of truth until we experience it ourselves. You cannot hope to make a man a surgeon by simply giving him a few books. You cannot satisfy curiosity to see a country by showing me a map. I must have actual experience. Maps can only create curiosity in us, to get more perfect knowledge. Beyond that they have no value. Whenever clinging to books only degenerate the human mind. In order to reach the superconscious state in a scientific manner it is necessary to pass through the various steps of Rajayoga I have been teaching. After Pratyahara and Dharana we come to Dhyana or Meditation. When the mind has been trained to remain fixed on a certain internal or external location then comes the power of concentration in an unbroken current as it were towards that point. This state is called Dhyana. When one has so intensified the power of Dhyana, as to be able to reject the external part of perception and remain meditating only on the internal part, the meaning of that state is called Samadhi. That is if the mind can first concentrate upon outer object, and then is able to continue in that concentration for a length of time and then by continued concentration to dwell only on the internal part of the perception of which the object was the effect, everything comes under the control of such a mind. This meditation state is the highest state of existence. Each one of the steps to attain Samadhi has been reasoned out, properly adjusted, scientifically organised and when faithfully practiced will surely lead us to the desired end."

This is in brief is the technique of doing meditation to reach the superconscious state of Samadhi and anyone who is interested in practicing it may refer to larger volumes on the subject and then undergo training under the guidance of an experienced teacher. Then only he can attain the goal quickly and successfully.

In short, the yogic practice has to be done step by step till one masters all the eight methods and it is then only that one can expect to achieve his desired goal.

## CHAPTER III

# METHODS OF RESEARCH IN YOGA

All types of yogic practices claim that they make earnest attempt to produce a closer interrelationship between the body and mind and also that they help to maintain a perfect homeostasis in both. In fact these practices tend to bring about utmost normalcy in our psychophysioloical functions so that there is less tendency towards psychosomatic imbalance in the face of external and internal influences as a consequence of stress and strain of life. Therefore in order to conduct Modern scientific Research on the effects of yoga one will have to use all the modern psychological, physiological and biochemical parameters to unravel the whole truth. Such scientific studies can be conducted in two ways (a) by conducting intensive studies on the well established yogis (b) by conducting yogic practices in normal volunteers.

Anand and Chhina were the first to conduct studies on 3 yogis who claimed to voluntarily stop the beating of hearts by using various physiological parameters such as E.C.G., E.E.G. and finger Plathysmograph. Similar studies were also conducted by Wagner, Bagchi and Anand. In another study Anand, Chhina and Baldev Singh conducted an investigation to assess the metabolic changes especially of $0_2$ consumption and $C0_2$ output in a yogi who was placed in an air tight sealed metallic cum glass box of 6' x4' size. The yogi remained inside the box from 8 to 10 hours. Kothari conducted a similar study on a yogi who remained in the underground pit for a period of 48 hours. The results of these studies indicated that these accomplished yogis develop a technique by which they can voluntarily depress their metabolic activity just as certain amphibians do during the period of hibernation. They attain such a power to control the metabolism through influencing the functions of autonomic nervous system.

In order to study some of these aspects Anand, Chhina and Baldev Singh extensively studied the E.E.G. pattern of four yogis during the period of their Samadhi or Meditation. Amongst them two yogis were given photic and auditory stimuli and the other two were given painful stimuli in the form of dipping their hands in the ice cold water at 4°C for 45 to 55 minutes.

It was found in these yogis that they showed persistant alpha activity with increased amplitude modulation during Samadhi. Further these alpha activities in E.E.G. could not be blocked by various sensory stimuli during meditation. Almost similar studies were conducted by Green and his colleagues on Swami Rama by using E.E.G, E.C.G. and other physiological parameters and found almost similar results. Thus one can say that these physiological techniques do reveal the effects of yoga on these people who can practice them daily. Therefore these techniques may be used in all such studies.

**Studies on human volunteers**

Studies on human volunteers are being conducted both for the physiological and therapeutic purposes. In the physiological studies a number of investigations were carried on the effect of yogic exercises in the form of Hatha Yoga on the cardiovascular, respiratory and nervous systems. They were studied by using E.C.G., Respirometer and E.E.G. and other similar equipments. Such studies seem to have been made initially at Kaivalya Dham at

Lonavala by Kuvalayananda and his associates. Thereafter a number of physiologists also conducted similar studies. Amongst various studies conducted after meditation, the studies of Wallace and his colleagues remain as most monumental work. They studied in those people who practiced transcendental meditation. They not only studied their people be fore and after transcendental meditation, but also during the performance of such meditation of Mahesh Yogi type.

**Transcendental Meditation**

The technique of conducting such a study on transcendental meditation is as follows. "The technique is defined as turning the attention inwards towards the subtler levels of thought and arriving at the source of the the thought". The technique involves no suggestion, mental control or physical manipulation. The instruction is given personally by a teacher trained by the organisation of Maharishi Mahesh Yogi. The technique is normally practiced twice a day for a period of 15 to 20 minutes. During the practice the person sits in a comfortable position with eyes closed and repeat certain words called 'Mantras'. Throughout the period of meditation the person concentrates his attention on this Mantra and tries to avoid all the mental destraction as far as feasible. These persons were then submitted for various physiological studies such as oxygen consumption through respirometer by open or closed circuit method. Similarly E. E. G. and E. C. G. recordings were also made to assess the changes in the nervous and cardiovascu lar systems. Blood studies were conducted for pH, $pO_2$, $pCO_2$ and lactates. Similarly skin resistance and other physiological studies were also conducted by them to assess the value of this type of Meditation with gratifying results.

From these extensive physiological studies of Wallace one can say with confidence that the regular practice of Tanscendental Meditation alone can cause many beneficial results both at the preventive and curative point of view. It would be interesting to observe as to what would happen if it is combined with other types of yogic practice.

**Our Approach**

Our experience about research on yoga is limited to (1) the practice of *Asanas* and their varied combinations, (2) the practice of *Pranayama* and (3) the practice of *Dhyana* i. e. meditation. Accordingly the methodology of research that we have evolved is relevant only to these areas of the practice of yoga.

Before we pass on to the details about the methods of research used by us and the results obtained on these parameters it may be relevant to point that the practice of yoga in general influences both the body as well as the mind. Therefore the methodology of evaluation of the effects of yogic practices need an evaluation on both these aspects. In the evaluation of the psyche, relief from anxiety, personality pattern and behaviuoral changes and the intellectual functions need an assessment. Likewise the bodily evaluation should concentrate more on the neurophysiological effects in terms of the neuro-chemistry and the electrophysiology of the brain, endocrine functions and the secondary metabolic effects besides the general physiological changes.

Besides the above mentioned physiological studies on the effect of the practice of yoga in normal persons, the therapeutic trials of the different kinds of practices in different clinical conditions will have to be conducted in terms of (1) clinical recovery from a particular disease, (2) stress and anxiety pattern and (3) the relevant physiological and biochemical changes as mentioned above. In view of thes facets some of our recent physiological studies on practice of yoga are being reproduced here under:

## I. THE ADMINISTRATION OF YOGIC PRACTICES

As mentioned in the following table (Tablel No. 1) the following sets of practices were studied, (1) comprehensive of Asanas, (2) selective practice of some important Asanas individually along with their complimentary postures and their different combinations (3) the practice of non-yogic postural exercises like Surya Namaskar and other physical exercises (4) the practice of Pranayamas, and (5) the practice of Dhyana i. e. meditation, especially of the Buddhist vipasana style and (6) combined practice of Asanas, Pranayama and Relaxation.

The young age and sex matched educated volunteers practised the respective procedures regularly daily at Yoga Research Centre, Institute of Medical Sciences, Banaras Hindu University under the supervision of an experienced teacher. All the volunteers remained on normal house-hold vegeterian diet. They were not allowed any other kind of exercise during the period. The sequential order and the duration of each practice was adapted as per conventional methods. The duration of the course of Asanas and pranayamas was 3 to 6 months and in cases of meditation 10 days. The assessments on the following parameters were done before and after the course of these practices.

## II. PARAMETERS OF ASSESSMENT

As pointed out earlier the parameters of assessment of the likely effects of the practice of yoga consisted of measures relevant to both the mind as well as the body. However, in most of the studies the following parameters were adapted.

### 1. Psychological studies

It consisted of—(i) the determination of anxiety level as per middle sex Hospital questionnaire, (ii) neurotocism index as per Maudsley personality inventory, (iii) assessment of the feeling of physical and mental well being as per Cornell Medical index health questionnaire. (iv) mental fatigue rate as per Joshi's digit cancellation test, (v) intelligence and performance quotient following Alexander's passalong test and the Kah's block design test, and (vi) the memory quotients following the Joshi's digit renounce test for immediate memory span and Matchair's memory scale.

TABLE 1

*Showing some physiological and biochemical changes following comprehensive practice of Asanas.*

| S. No, | Observations | Initial | 3rd month | 6 month |
|---|---|---|---|---|
| 1. | Body wt. in lbs. | 123 ± 12 | 119 ± 7 | 118 ±13 |
| 2. | Rate of resp/M | 16.8 ± 4.1 | 16.6 ± 3.4 | 13.4 ± 3.4 |
| 3. | Chest expansion in mm. | 3.4 ± 1.29 | 4.33± 1.37 | 4.73± 1.48 |
| 4. | Vital capacity in ml | 3729 ± 232 | 4372± 336 | 4515 ±349 |
| 5. | Breath holding time in sec. | 74.77±18.94 | 99.3 ± 38.4 | 101.2 ±23.8 |
| 6. | Fasting blood sugar mg% | 74.6 ± 5.26 | 64.17± 8.4 | 63.0 ±10.8 |
| 7. | Sr. Cholesterol mg% | 149.7 ±31.24 | 113.6 ±19.99 | 133.5 ±30.1 |
| 8. | Sr. Protein g% | 5.76± 0.33 | 5.54± 0.51 | 6.09± 0.35 |
| 9. | Urinary 17 OHCS mg/24 hrs | 3.65± 2.02 | 5.8 ± 3.01 | 10.3 ± 4.1 |
| 10. | Urinary 17–ks mg/24 hrs | 11.46± 8.3 | 5.87± 4.0 | 7.3 ± 2.3 |
| 11. | Urinary VMA mg/24 hrs | 3.14± 2.1 | 3.33± 2.38 | 4.37± 1.63 |
| 12. | Plasma acetylcholine in mg% | 181.7 ± 149 | 101.1 ± 34.1 | 58.7 ±18.05 |

Values are mean of 12 observations ± S. D

### 2. Physical Assessment

This mainly consisted of certain anthropometric measurements specially the height, weight, chest and abdominal girth regarding the changes occurring in these indices after the course of the practice of different yogic procedures.

### 3. Physiological Assessment

The physiological studies included the determination of (i) pulse. (ii) respiration, breath-holding time and vital capacity (iii) blood pressure, (iv) E. C. G. and (v) E. E. G. patterns before and after the course of the practice of yoga. These records were taken using a multichannel recorder system. The records were taken in basal as well as under the influence of stress factors like cold pressor, breath holding, injection of β–adernergic blocking agents and the injection of atropine. This was done to assess the autonomic integrity of the persons under study.

### 4. Neurohumoral Assessment.

As pointed out earlier the neurophysiological changes are of greater significance as regard to the efiects of most of the yogic practices. This consisted of (i) E. E. G. records and (2) biochemical determination of certain neurohumors and the related enzymes namely : (i) RBC acetylcholine by bioassay on frog rectus abdominis as per method of Macintosh and Perry (1950), (ii) RBC cholinesterase by Caraway's spectrophoto–metric method (1950), (iii) plasma catecholamines by the method of Ghosh *et al* (1951), (iv) plasma monoamine oxidase by the method of McEven (1964). (v) whole blood histamine by bioassay on guinea pig ilium as per method of Code and Macintosh (1964), (vi) plasma histaminase as per method of Arsen and Kemp (1964).

### 5. Endocrine Functions

The practice of yoga being more allied to stress response in the body, special attention was paid to the evaluation of adrenocortical functions which consisted of (i) determination of plasma cortisol by the method of Mettingly *et al* (1962), (ii) determination of urinary 17–hydroxycorticosteroids as per method of Appleby *et al* (1956), (iii) urinary 17–ketosteroids as per method of King and Wooton (1964), (iv) urinary V.M.A. as per method of Pissano *et al* (1964), and (v) urinary testosterone following a modified Zimmermann test described by Gode *et al* (1972).

### 6. Metabolic studies

The routine metabolic studies which were conducted in the present context included (i) estimation of blood sugar, (ii) estimation of serum lipids, (iii) estimation of serum proteins and (iv) the determination of the rate of urinary excretion of nitrogen.

## III. RESULTS OF SCIENTIFIC STUDIES

There were significant changes in the studies conducted and it would be interesing to know the results.

### 1. The comprehensive practice of asanas

The combined practice of 12 major yogic postures for 6 months showed a reduction in body weight, reduction in abdominal girth, reduction in the rate of respiration with inreased vital capacity and breath-holding time and notable change in E. E. G. with appearance of prominent alpha waves. (Fig. 13). There was notable reduction of serum cholesterol and blood sugar levels (Fig. 14). The serum proteins were increased. There was some increase in plasma cortisol and urinary corticoids including, testosterone while plasma acetylcholin and cholinesterase levels were found decreased (Fig. 15, 16 and 17).

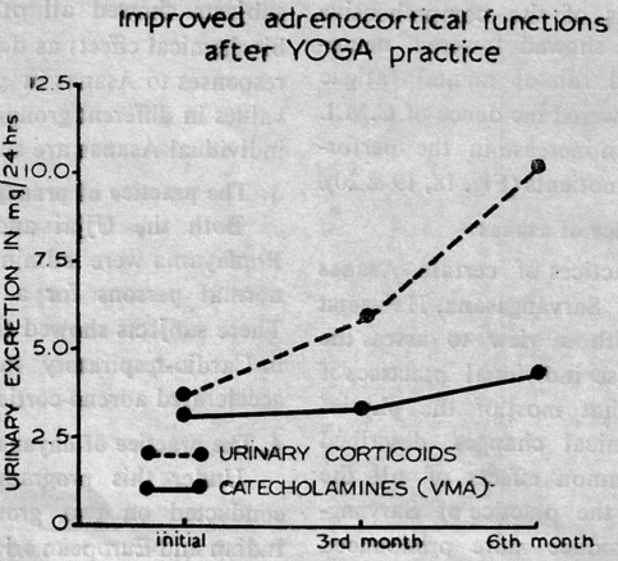


Fig. 17. There was slight rise of both Corticoids and Catecholamines Excretion after Yogic practice.

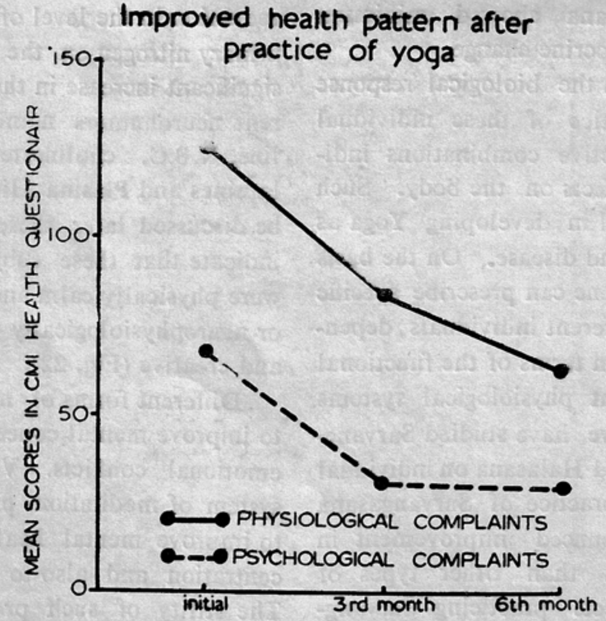


Fig. 18. Shows a marked decrease in the Physiological and Psychological complaints.

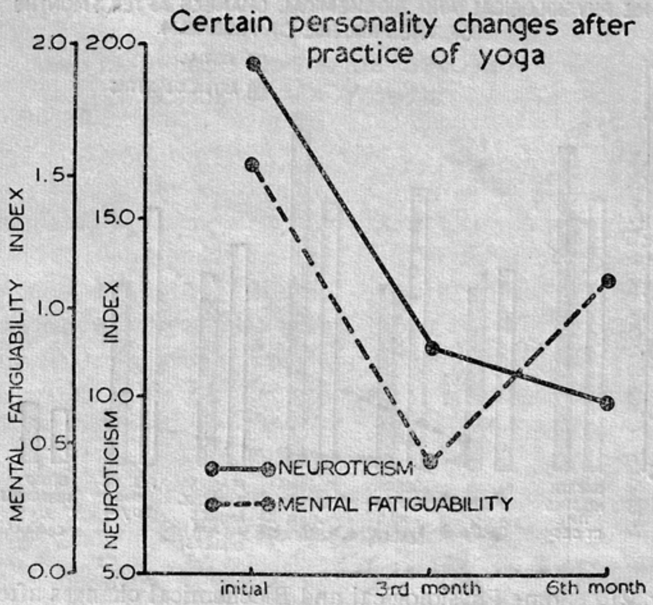


Fig. 19. The Neuroticism and mental fatiguability also decreased markedly after 6 months Yogic practice.

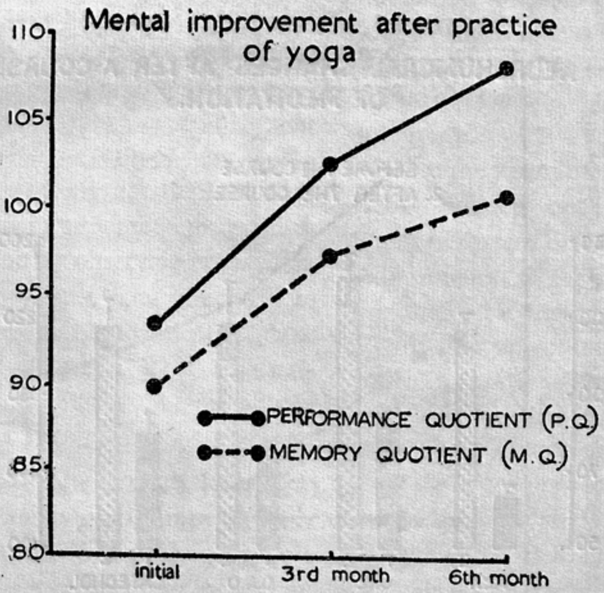


Fig 20. The performance and memory quotient improved considerably at the end of Six months.

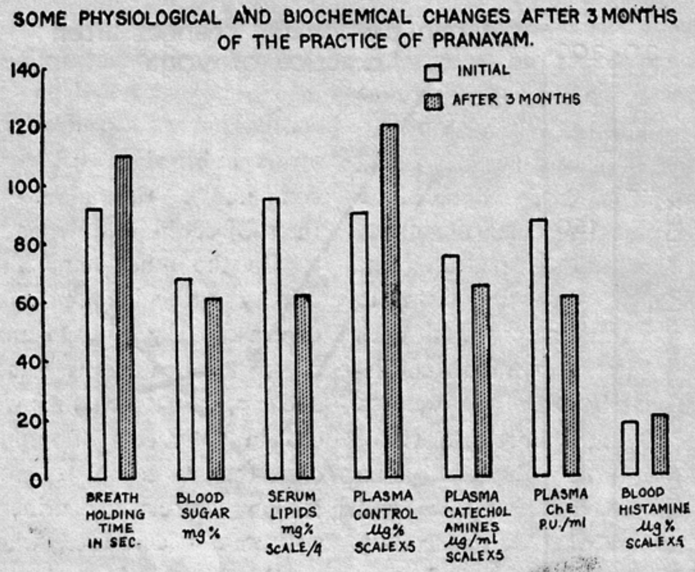


Fig. 21. Some Physiological and Biochemical changes after 3 months of the practice of Pranayama.

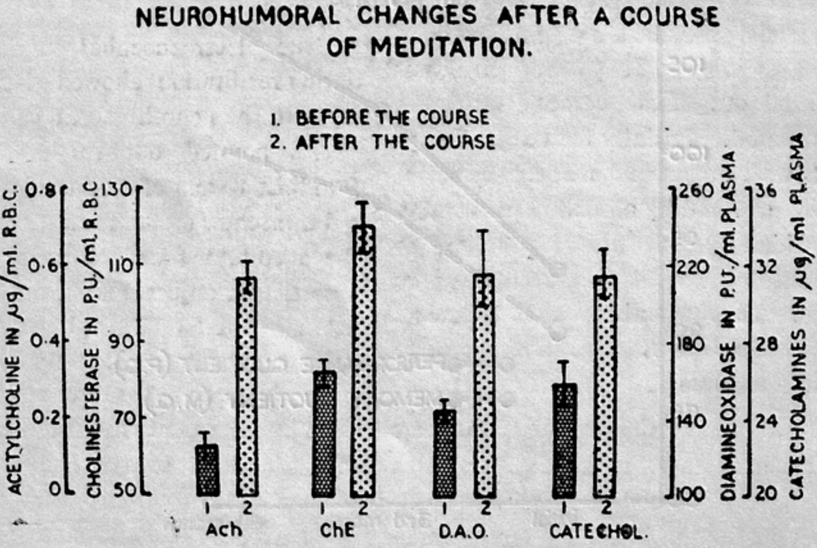


Fig. 22. A Vipasana meditation produces a marked rise in the Neurohumor of the blood.

Meditation is a part and parcel of the system of Ashtanga Yoga. We have tried to assess the biochemical effects of meditation. Fortunately a vipasana meditation camp was organised at the Buddhist Vihar, Varanasi Cantt in the months of December 1973 and January, 1974 and we availed the opportunity to study certain biochemical changes in the volunteers under meditation practice. The study has become more interesting owing to the fact that two separate camps had been organised; one, with English medium consisting of volunteers mainly from the western white population and the other with Hindi medium in which all the volunteers were Indians. Availability of both western and Indian subjects further gave us an opportunity to make comparative studies on the effect of meditation in these two groups of population.

Ten subjects from each of the aforesaid two groups of meditation camps were selected for the present study.

These subjects remained in a controlled camp on restricted vegetarian diet and movement with strict prohibition of any kinds of intoxicants or drugs. They were also not allowed to go out of the camps during the meditation period. Initially for the Ist 3 days the subjects were taught and made to practice concentration of mind by observing pranayama following which they learnt and practised to turn their entire physical and mental make up inwards. They practised this Vipasana system of meditation 8 to 10 hours a day continuously for 10 days.

Further, in one of the Indian volunteers who had attended many such camps and was fully trained, serial blood samples were collected during meditation through his pre-cannulated cubital vein with simultaneous E. E. G., E. O. G., E. M. G. and E. K. G. records before, during and immediately after 45 minutes period of meditation.

As is evident from tables significant increase was noted in the acetyl-choline, cholinesterase, histaminase and catecholamine levels in blood on 11th day of the course as compared to the initial values in almost all the subjects in both the camps.

On the other hand the plasma cortisol. urinary corticoids and nitrogen were found decreased (Fig. 23). On analysis of the results of the two camps it was observed that the above mentioned changes were more pronounced in volunteers of camp I (esteners) as compared to camp II (Indians). Moreover, in Indian subjects the urinary nitrogen was not significantly decreased whereas it was found notably lowered in westeners.

The serial biochemical studies in the blood of one of the selected fully trained volunteers showed an increase in the acetylcholine and cholinesterase level during the actual state of meditation whereas catecholamines and histaminese did not show significant changes (Fig. 24).

The electroencephalographic records taken during meditation showed alterations conforming with the neurohumoral changes.

As pointed out earlier Vipasana is a Buddhist system of meditation claiming increased awareness of the mind. During meditation, the meditator tries to concentrate his mind on a particular object and is supposed to be more active mentally. Though physically he looks calm and quiet, mentally (neuropsychologically) he becomes more active and vigilent.

This is evident from the observations made in the present study. The lowered levels of plasma cortisol, urinary nitrogen and corticoids indicate a less stressful state. On the otherhand increased neurohumoral activity in the blood and corresponding changes in the E. E. G.

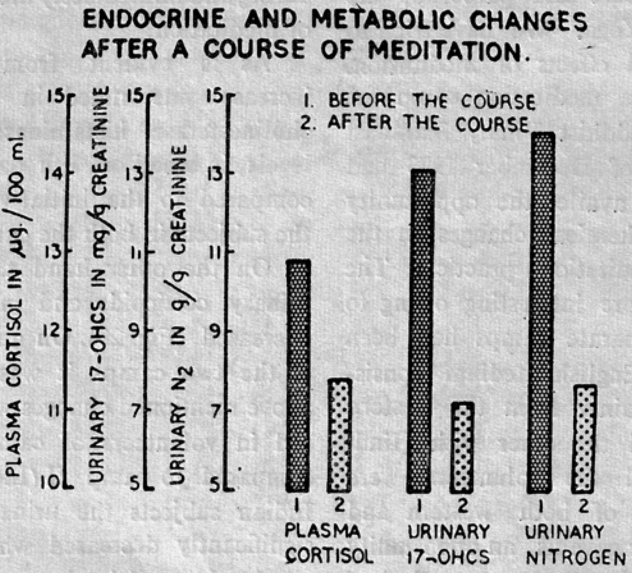


Fig. 23. Vipasana type of Meditation causes marked fall of plasma cortisol and urinary corticoids.

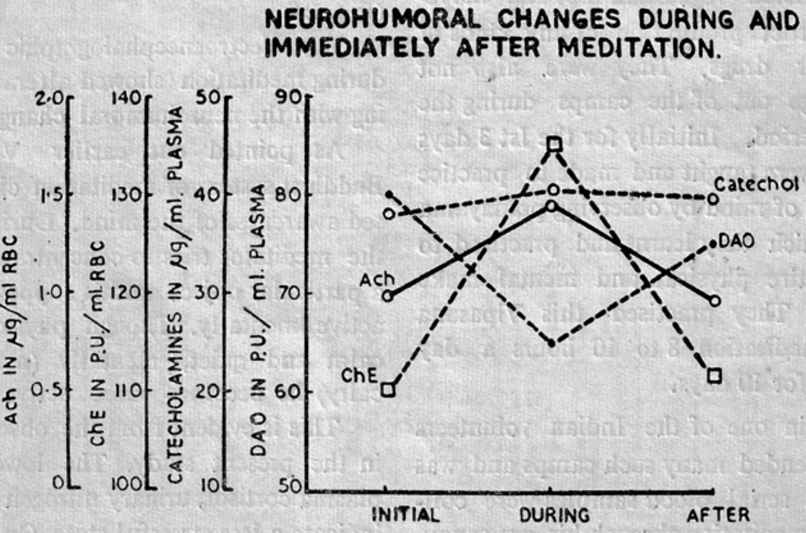


Fig. 24. During meditation one can see a significant rise of acetylcholine content of the blood whereas other changes are not significant.

suggest that they are neuropsychologically more alert and in a state of increased creative activity.

Thus the above mentioned meditation appears to reduce the quantum of stress resulting in lowered metabolic changes in the body. It also enables an individual to concentrate his mind on any particular chosen object of life with improved awareness as is evident from the biochemical changes observed.

### 5. Combination of Asana, Pranayama and Relaxation

In view of the selective response of the practice of Asanas, Pranayama and Dhyana, a group of volunteers were subjected to the combined practice of certain Asanas, Pranayama and relaxation procedure in the form of Shavasana. The volunteers practising such a course for three months showed different types of changes. These subjects showed, a decrease in the blood level of different neurohumors and the related enzymes. Besides they had the benefit all physiological changes that could be expected from the practice of Asanas or Pranayama. Here it may be remembered that practices of Asanas alone decreases some of the neurohumors specially acetylcholin. While meditation remarkably increases the bood level of Acetylcholin and other neurohumors. Thus the combined practice of selected Asanas, Pranayama and relaxation appear to be more useful (Fig. 25).

Thus the physiological and biochemical studies conducted on persons practising different kinds of yogic practices indicate that both Hatha Yogic as well as the Meditative practices produce both bodily as well mental effects. The mental effects of meditation is obvious but

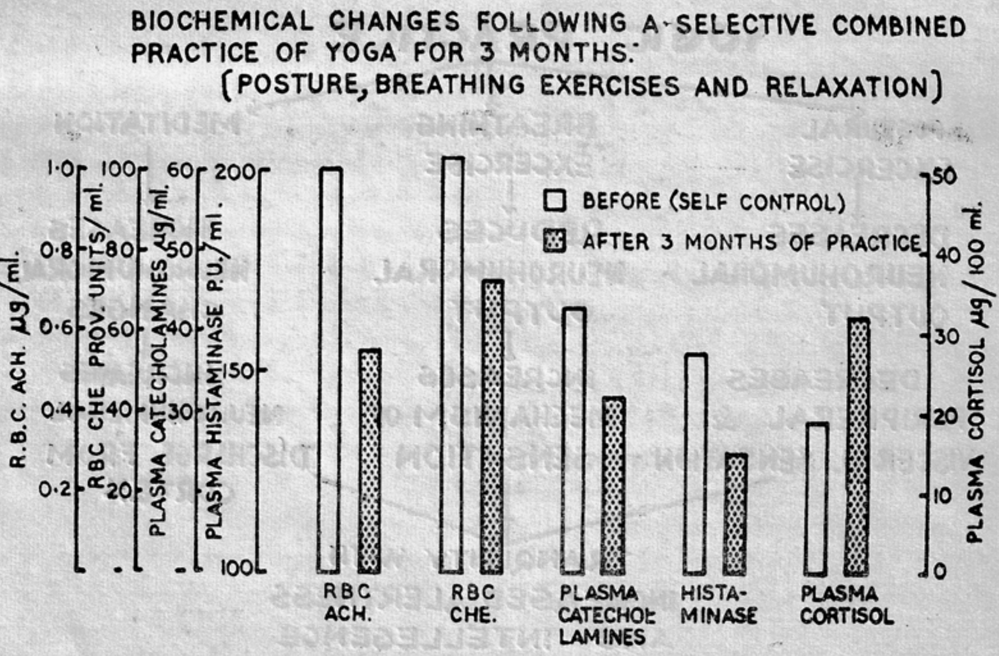


Fig. 25. Note a fall of Neurohumors and slight rise in plasma cortisol.

how Hatha Yogic practices produce mental effects is difficult to explain. However, most of the Asanas and Pranayamas produce bodily effects like vitalisation of endocrine functions, improved general bodily functions and metabolic corrections. On the other hand meditation makes an individual mentally more alert and aware as is evident from increased blood level of different neurohumors and the related enzymes. On the contrary they reduce the bodily stress which is evident from the reduced blood level of cortisol and a lowered rate of urinary excretion of nitrogen. Therefore such practices may prove useful for persons suffering from anxiety states and depression (Fig. 26).

Thus the methodology of research on any kind of yogic practice must include the parameters for assessment of the psychological, neurophysiological, endocrine and metabolic changes so that the bodily as well as mental effects of these practices may be evaluated (Tables 1–5).

The therapeutic indications of different yogic practices should be worked out in the light of their specific physiological effects. Therefore, intensive physiological studies on each individual practice and their combinations are urgently needed.

## IV. THERAPEUTIC TRAILS ON YOGA

The incidences of stress disorders are increasing at an alarming rate throughout the world especially in elite population living in the urban areas. Therefore, there is an urgent need for conducting a thorough clinical study to evaluate each one of the yogic measures in overcoming such disorders. Once the value of these measures is fully established there is

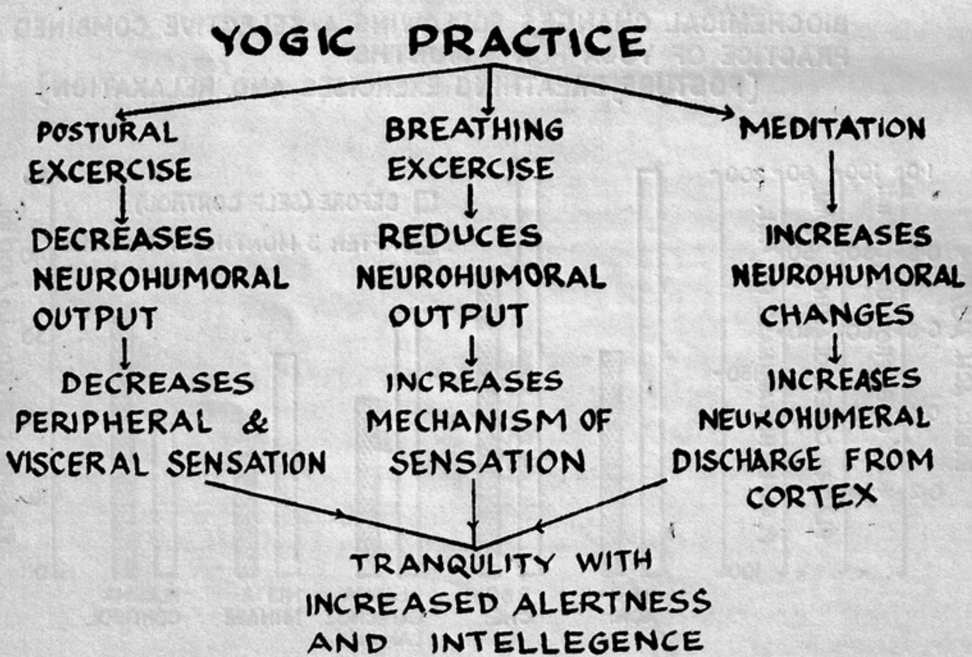

YOGIC PRACTICE
POSTURAL EXCERCISE
DECREASES NEUROHUMORAL OUTPUT
DECREASES PERIPHERAL & VISCERAL SENSATION
BREATHING EXCERCISE
REDUCES NEUROHUMORAL OUTPUT
INCREASES MECHANISM OF SENSATION
MEDITATION
INCREASES NEUROHUMORAL CHANGES
INCREASES NEUROHUMERAL DISCHARGE FROM CORTEX
TRANQULITY WITH INCREASED ALERTNESS AND INTELLEGENCE

Fig. 26. A summary of the results seen following three types of Yogic practices.

no reason why they should not be universally adopted not only for curing these diseases but also for preventing their recurrence. Kuvalayananda and Venekar the two pioneer workers in the field had thus stated "The real place of yogic therapy as a whole lies in the psychosomatic field of medicine where it seems to have a special application. The Yogic therapy as such cannot be of much use in acute diseases nor in infectious process, but as indicated earlier, it can prevent such attacks by improving one's general resistance and power of immunity. It could also provide rehabilitatory treatment after a disease has been tackled successfully. All this, however, will require a good and understanding co-operation between the Doctor and the Yogic therapeutist."

In spite of these and other similar statements made by well known workers in the field there are very few studies to indicate the bodily or mental changes that take place after each type of yogic practice. Therefore, before we actually adopt these measures on patients with psychosomatic disorders, we must assess their utility in normal healthy volunteers. Just as we conduct studies on the use of Newer Drugs Pharmacologically in healthy subjects before we use them on patients, in the same way, we must at first study the physiological changes that take place after each one of these yogic practices; only thereafter, we should use them for therapeutic purposes.

Thus we selected several groups of normal healthy young students and submitted them for undergoing courses of yogic exercise of given type. The results of these scientific studies have been described earlier. In view of the beneficial results the present therapeutic trials have been instituted.

For this study, the following 5 groups of patients were selected :

| | |
|---|---|
| Thyrotoxicosis | 30 |
| Hypertension | 6 |
| Bronchial Asthma | 2 |
| Nervous dyspepsia | 6 |
| Rheumatic disorders of spine | 8 |
| | 52 |

They were at first fully investigated by taking full History, Physical examination, required Laboratory and Radiological investigations. Once the correct diagnosis was arrived at they were given the conventional modern treatment for a specified period. Inspite of continuing these treatments for a certain period if one did not get the desired results, these patients were referred to Yoga Research Centre to consider the feasibility of giving the additional yogic therapy also. Once it was decided to add yoga therapy they were asked to

**TABLE 2**

*Showing the physiological changes in persons undergoing Pranayama for 6 months.*

| S. No. | Observations | Initial | 3rd months | 6 months |
|---|---|---|---|---|
| 1. | Body wt. in lbs. | 119.8 | 118.4 | 121.8 |
| 2. | Abdominal girth in cm. | 80.0 | 77.0 | 73.4 |
| 3. | Breathholding time in second | 91.6 | 118.0 | 126.0 |
| 4. | Vital capacity in cc. | 4617 | 4529 | 4631 |
| 5. | Blood pressure in mm Hg | 104/90 | 106/89 | 110/90 |
| 6. | Pulse/Minute | 65.2 | 65.3 | 62.2 |

TABLE 3

*Showing the biochemical changes in volunteers undergoing a 6 months course of Pranayama.*

| S. No. | Observations* | Initial | 3rd month | 6th month |
|---|---|---|---|---|
| 1. | Fasting blood sugar in mg% | 68.3 | 62.5 | 65.3 |
| 2. | Total serum lipid in mg% | 380 | 250 | 135 |
| 3, | Total serum protein in g% | 6.10 | 7.00 | 8.40 |
| 4. | Plasma cortisol in/ug% | 18.0 | 24.5 | 25.5 |
| 5. | Urinary 17-OH corticosteroids in mg/24 hrs. | 5.75 | 7.26 | – |
| 6. | Urinary 17-Keto-steroids in mg/24 hrs. | 4.82 | 5.45 | 6.37 |
| 7. | Urinary VMA in mg/24 hrs. | 3.66 | 5.20 | 4.40 |
| 8. | Plasma adrenaline in/ug% | 14.9 | 13.2 | – |
| 9. | Plasma cholinesterase in units. | 87.4 | 61.5 | 69.4 |
| 10. | Blood histamine in ug% | 3.50 | 4.20 | 3.40 |

* Mean of 6 observations at each point.

TABLE 4

*Showing the biochemical changes following a 10 days course of Vipasana meditation in a group of Indian subjects.*

| S. No. | Investigations | Absolute values | | Mean Diff. ★ | SD | SE | t |
|---|---|---|---|---|---|---|---|
| | | Initial | Final | | | | |
| 1. | Ach. (ug/ml RBC) | 0.93 | 2.69 | + 1.76 (7) | ±0.99 | ±0.375 | 4.69 |
| 2. | ChE (P.U./ml RBC) | 95.0 | 116.0 | ± 21.0 (7) | ±4.41 | ±9.25 | 2.27 |
| 3. | Catecholamines (Ug/ml plasma) | 30.25 | 35.48 | + 5.23 (7) | ±4.61 | ±1.74 | 3.00 |
| 4. | Plasma cortisol (Ug%) | 22.91 | 17.71 | – 5.20 (7) | ±5.67 | ±2.14 | 2.43 |
| 5. | Histamines (P. U./ml plasma) | 146.0 | 175.50 | ± 29.50 (5) | ±56.75 | ±25.44 | 1.15 |
| 6. | Urinary nitrogen (g/g creatinine) | 8.28 | 6.93 | – 1.35 (7) | ±4.71 | ±1.68 | 0.80 |

* No. of observation within the parentheses

visit the Yoga Centres periodically for a proper evaluation of these measures from time to time.

Results of these yogic practices indicate that in most of these cases with stress disorders there had been a gradual improvement in their conditions both physically and mentally with the result that in due course of time they could stop the drug treatment and could remain healthy and happy only with yogic practice. Such an improvement usually produced great physical and mental satisfaction to the patients and he gets an unusual confidence in himself to resume the normal activities. The results of individual groups are as follows :

TABLE 5

*Showing the physiological and biochemical changes following the 3 months course of the combined practice of Asanas, Pranayam and Shavasana.*

| S. No. | Observations | Initial (Mean) | After 3 months (Mean) | Comparison |
|---|---|---|---|---|
| 1. | Body wt. in kgs | 51.0 (5) | 50.3 (5) | t 1.237<br>p 0.05 |
| 2. | Pulse rate per minute | 72.0 (5) | 66.8 (5) | t 3.077<br>p 0.05 |
| 3. | Systolic B.P. in mm Hg | 115.4 (5) | 109.8 (5) | t 3.111<br>p 0.05 |
| 4. | Diastolic B.P. in mm Hg | 86.0 (5) | 87.0 (5) | t 1<br>p 0.05 |
| 5. | Plasma cortisol mg% | 19.04 (5) | 32.0 (5) | t 1.756<br>p 0.05 |
| 6. | RBC Ach. ug/ml | 1.006 (5) | 0.462 (5) | t 5.850<br>p 0.001 |
| 7. | RBC ChE PU/mg | 101.0 (5) | 72.0 (5) | t 6.150<br>p 0.001 |
| 8. | Plasma catecholamines ug/ml | 42.60 (5) | 32.2 (5) | t 6.973<br>p 0.001 |
| 9. | Plasma Histaminase PU/ml | 152.5 (5) | 130.5 (5) | t 3.206<br>p 0.05 |
| 10. | Urinary 17-KS mg per g-creatinin | 3.86 (5) | 8.03 (5) | t 4.090<br>p 0.05 |
| 11. | Urinary 17-OHCS mg per g-creatinin | 6.72 (5) | 7.30 (5) | t 1<br>p 0.05 |
| 12 | Urinary VMA mg per g-creatinin | 2.480 (5) | 1.614 (5) | t 1.140<br>p 0.05 |

Number of observations within parentheses.

## Thyrotoxicosis

Out of 30 cases 8 cases have completely recovered from their illness and they are only doing yogic practice in the form of a set of prescribed Asanas. The remaining 22 are practising Asanas alongwith medical measures in the form of antithyroid drugs, beta adrenergic blockers and tranqualisers. As their condition improved these drugs would be gradually reduced and they will be kept only on prescribed asanas. It would be too soon to predict the final results on these cases, but present assessment indicates that those who regularly perform these yogic procedures and those who are relatively in the early stages ultimately do recover from their illness by the yogic practice. Further by continuing such practices they are able to prevent the recurrence of this disease. Since recurrence is a fairly common occurence in thyrotoxicosis one should advise the continuation of these yogic practices for the rest of their life (Fig. 27 & 28).

## Hypertension

At present all our 6 cases are taking both medicines and yogic practice. Since the

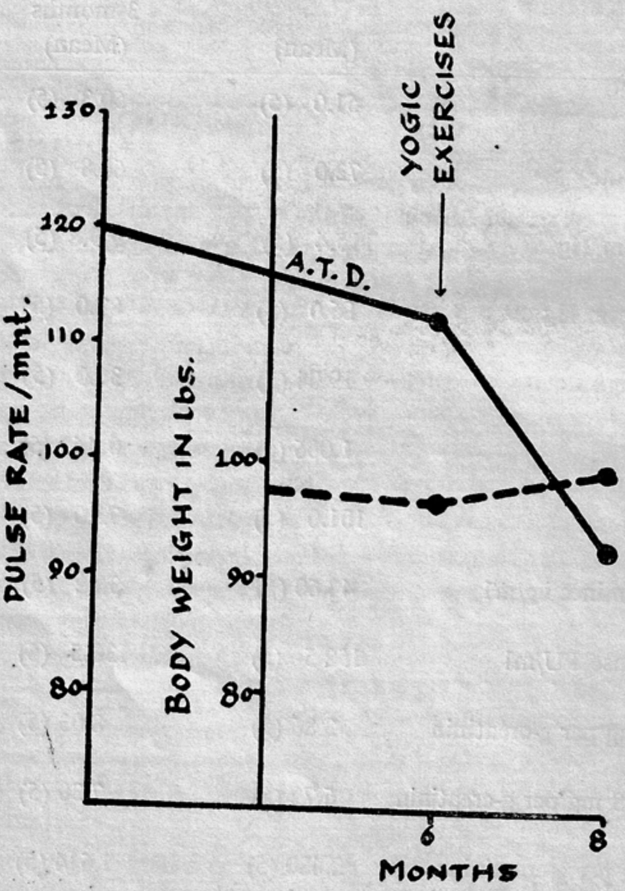


Fig. 27. Improvement seen in Thyrotoxicosis cases following Yogic practice both with regard to weight and pulse rate.

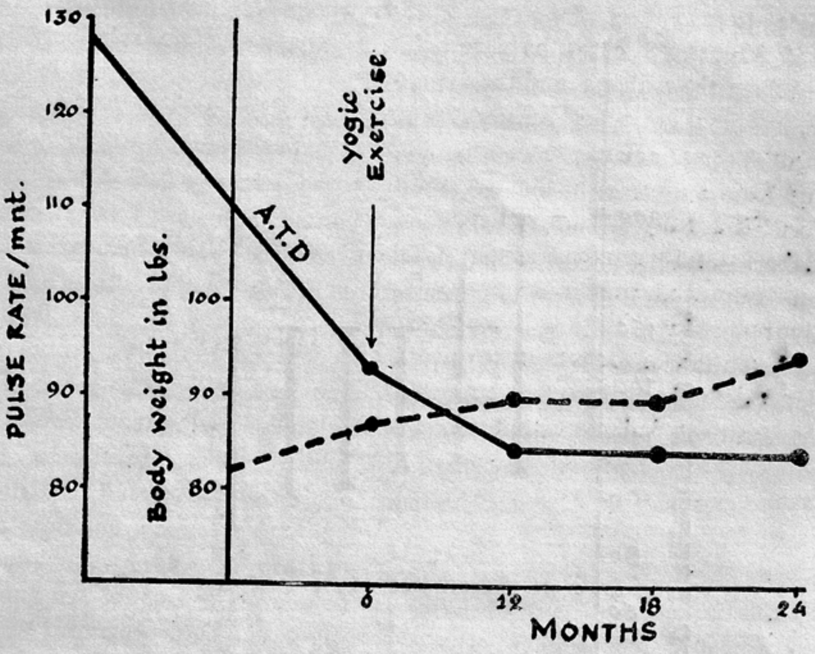


Fig. 28. A chart of the case of thyrotoxicosis and improvement seen after Yogic practice.

introduction of yogic practice, their requirement of medicine is decreasing. However, gradually we hope to keep them only on yogic practice and see how they respond to this reatment. However, subjectively all these patients feel much better and have become much more sober and calm after the addition of yogic practice than when they were kept with medicine alone (Fig 29). However, this needs further follow up.

**Bronchial asthma**

In both of our cases who are medical men themselves, the yogic practice greately reduced the intensity of attacks thereby the intake of medicines. Further susceptibility to get upper respiratory tract infection became much less and therefore they felt an overall improvement in their condition by the use of yogic practice.

**Nervous dyspepsia**

There are six selected cases in this group who after a thorough investigation did not show having any evidence of pathological lesions. Four of them were suspected to be having peptic ulcer and the other two spastic colitis. However all these cases were given the yogic exercises and we found all of them completely overcoming their troubles without the help of any other medicines. We are still following these cases.

**Rheumatic lesions of the spine**

There were eight cases with various types of severe backache and rigid spine. On investigation no bony lesions were detected. They were therefore labelled as rheumatic lesions of the spine and were given the usual antirheumatic medical measures. When they could not get any beneficial results, they were submitted for

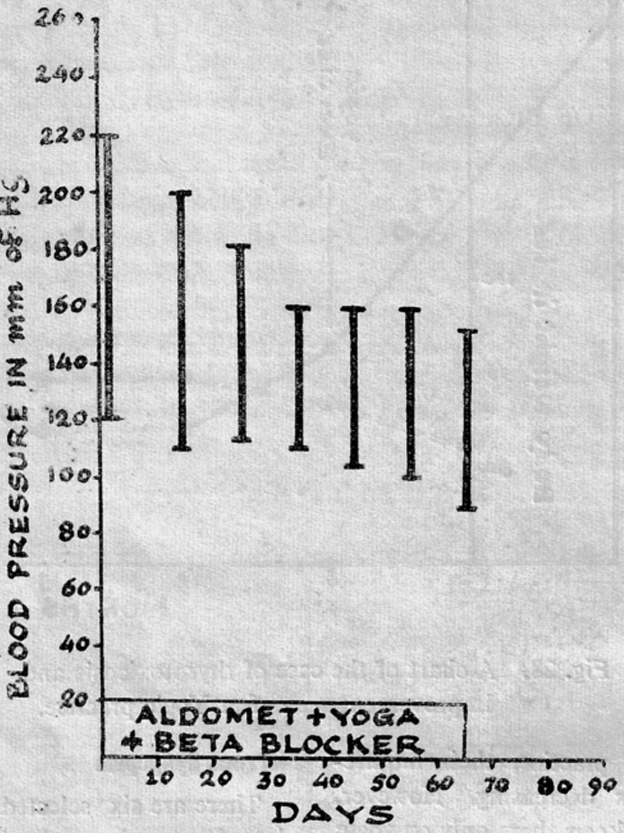


Fig. 29. Fall of blood pressure seen in Hypertension cases following Yogic practice and drug therapy.

yogic practice with prompt recovery in all the cases.

From these observations one can safely say that yogic practices namely Asanas, Pranayamas and Dhyana or meditation have definite place in the management of various psychosomatic stress disorders. They produce such beneficial results by balancing and normalising the various neurohumoral, endocrinal and metabolic disturbances that had taken place in these disorders. Therefore the present need is to find out which of the procedures are useful in which types of stress disorders. Unless these procedures are specifically prescribed for each types of disease, the results may not be uniformaly satisfactory. Hence there is an urgent need for standardisation of these procedures in the treatment of various stress disorders.

Thus in our experience, thyrotoxicosis can be treated with Sarvangasana and other supportive procedures, the hypertension with Shavasana and other related practices. Similarly in other stress disorders also we are in the process of standardising these procedures. There will always be a need for individualisation of these procedures in a given case. We have so far not used meditation in the treatment of any stress disorders though we would like to use it for overcoming various disturbed psycholygical states.

## THERAPEUTIC USE OF BIOFEEDBACK METHODS

Until recently there was no scientific method by which one could psychologically and physiologically study the relationship of the functioning of body and mind. It was known for a considerable period of time that changes in the physiological states affect mental and emotional states and conversely changes in the mental and emotional states produce physiological changes. But beyond this there is not much information about this vital relationship of body and mind. In order to study this Green and his colleagues developed Biofeed back meter through which one could constantly read and record his body temperture, muscle tension, and alpha rhythm of the brain. Thereafter one is trained to control over these body-mind functions for his own benefit during health and disease. Thus one can learn to relax his muscle tension, raise his body temperature or raise his alpha rhythm of the brain by voluntary practice repeatedly through yogic practice, Zen Meditation or autogenic training. Thus Green *et al* state "Many physicians estimate that from 50% to 75% of human disabilities are psychosomatic and that psychosomatic Disease and psychosomatic Health are in fact opposite sides of the same coin. Many Researchers feel that by the development of suitable training methods (Primarily using the powerful technique of biofeedback) many diseases that are psychosomatic such as migraine headache may be alleviated without the use of drugs".

Further Green *et al* also observe "The concept of psychosomatic Health in contradistinction to psychosomatic disease, implies that one can be to some extent the controller of himself and if not merely a victim of his genetics and environmental conditions. This does not mean that one consciously takes over the continuos regulation of normal automatic functions, but it does mean that the homeostatic balance points for various physiological processes can be shifted at will and that deautomization can occur". From these observations and also that of others one can safely say that all these methods are primarily directed towards the development of voluntary control over the autonomic functions of the body for the prevention and treatment of various psychosomatic diseases.

### Migraine

By following these biofecd back techniques Sargent, Walters and Green have treated successfully a number of Migraine and Tension Headache cases. It is well known that Migraine Headache is a common condition which is very difficult to treat by all the available drugs. In this disease as a result of excessive stress and strain there occurs increased activity of cerebral cortex leading to limbic response, hypothalamic response, autonomic response and somatic response in the form of sympathetic dysfunction of vascular behaviour in the head. In these cases, selectively the temporal vessesls become the target of vasoconstriction as a result of excessive sympathetic stimulation followed by excessive Histamine liberation leading to development of acute Headache. By following these biofeed techniques repeatedly they could reduce the sympathetic activity thereby the Headache in a 81% of 42 cases, indicating that by these measures one can develop a control over the autonomic nervous system.

Thus Green *et al* have concluded that by following autogenic training and Biofeed back system one can achieve (1) Relaxation of muscle tension to extremely low level which can be learnt with feedback of E. M. G signals (2) Control of warmth in the required region of the. body. (3) Increase in the percentage of alpha rhythm of the brain with E. E. G (4) all these usually lead to a state of tranquility of mind.

By these measures one can not only prevent the various psychosomatic disturbances but also the psychomatic disorders such as migrane in their early stage.

**Therapeutic use of Transcendental Meditation**

As already stated earlier Transcendental Meditation is another method by which one can not only treat some of these stress disorders but also can prevent them if practiced regularly. The main action of such meditation on human beings have been extensively by Wallace and Benson. Thus a 20 to 30 minutes meditation produced a marked decrease in the oxygen consumption and the carbon dioxide elimination similarly during the period of meditation blood lactate decreased considerably showing increased anaerobic metabolism during the period of metabolism. At the same time there was a rapid rise of electrical resistance of the skin possibly due to increased sympathetic activity during the period. Further there was an increase in the alpha waves in E.E.G showing an increased capacity for creative activity. The pulse and blood pressure did not show much change, but the respiration rate decreased to a considerable extent. Thus Wallace and Benson conclude "The pattern of changes suggest that meditation generates an integrated response of reflex that is meditated by the central nervous system. A well known reflex of such a nature was described many years ago by a noted Harvard physiologist Walter B. Cannon. It is called "fight" or "flight" or defense alarm "reaction". The aroused sympathetic nervous system mobilises a set of physiological responses marked by increases in the blood pressure, heart rate, blood flow to the muscles and oxygen consumption. The Hypometabolic state produced by meditation is of course opposite to this in almost all respects". Because of this only the regular practice of such a meditation can become an affective measures for overcoming all the stress disorders. Psychologically such a practice would decrease anxiety and improve mental health in general causing sound sleep and calm and quite mental state. Development of such a state of mind is unique for transcendental meditation which are not seen in autosuggestion, Biofeedback system or Hypnosis. Here in this case whereas it produces complete relaxation of both body and mind, but at the same time it tries to maintain the full alertness and awareness of the mind. Because of this the creative activity of mind is fully maintained so that one can do his work much better than before.

Because of these advantages transcendental meditation is used for therapeutic purpose in many conditions. According to Benson regular practice of such meditation gradually decreases the blood pressure without having any sedative action. Similarly, it is also used extensively in overcoming drug abuses such as Marijuana. Here the practice of meditation reduced the intake of marijuana considerably. Similarly as per the studies of Mahammed Shafi and others it has also proved useful for decreasing the number of cigarette for smoking in those who are habituated to smoke a large number of them. Similarly, the same authors have also studied the effect of meditation on Alcohol intake. It is interesting to note that even these patients have reduced the intake of alcohol considerably after their initiation to transcendental meditation. Similarly, it was also found useful in reducing anxiety and other similar features in various psychiatric diseases. These problems are being studied extensively at a rapid pace and it is hoped that some useful results will come out of these studies.

Goldman has further studied the physiology of this meditation by following skin resistance and conduction. According to him skin conduction level indicates cortical activity of the brain and the spontaneous skin conduction indicates the activity of the limbic system (visceral brain). Following meditation there is an improvement in the cortical activity, but a decrease in the activity of the limbic system. This might be the explanation for getting a complete relaxation and tranquility of mind after meditation. But at the same time they are more alert and active psychically which is a phenomenon of cerebral cortex. However, this explanation needs further study, From all these findings, Yogic meditation has a definite place in the management of various psychosomatic disorders.

## CHAPTER IV

# PHILOSOPHICAL ASPECTS OF YOGA

After discussing various matters related to scientific aspects of yoga it is but natural that we should now try to understand certain philosophical basis of yogic practice. In the earlier period, the entire sphere of yogic practice was thought to be only of philosophical interest. However as the scientists have now started investigating various types of yoga and its different methods of practices such as asanas of different types, pranāyāma and meditation, many scientific explanations have been given for the benefits one usually gets after their practice. We have already seen earlier that asanas, pranāyāma and relaxation procedures through savāsana usually give rise to decrease in all the Neurohumor contents and causing some type of state of mental tranquility and peace; on the other hand the vipasana type of meditation produced an increase in the neurohumoral contents, indicating an increased awareness and an enhanced capacity for doing more of creative activity of the mind. However, when one shows the sign of developing enhanced capacity to do more of creative work it should always be better to direct his attention to the principles of philosophy of yoga so that he can practice them sincerely and wholeheartedly for the benefit of humanity as a whole. In case he does not fully utilises the creative energy released following meditation properly and in a right direction, there is a possibility that he may misuse such an energy for his own ultimate destrucion bodily, mentally or both. Because of these possibilities of danger, one has to study yogic philosophy and then put them into practice in his everyday life.

All these philosophical studies and their implementation in daily practice must be done by every person himself. No one else can teach him effectively as to how to practice them. Thus Swami Vivekanand says "Men must teach themselves...Do you think you can teach even a child ? You cannot. The child teaches himself. Your duty is to afford opportunities and to remove obstacles. A plant grows. Do you make the plant to grow ? Your duty is to put a hedge round it and see that no animal eats up the plant and then your duty ends. The plant grows of itself. So is it in regard to the spiritual growth of everyman. None can teach you. None can make a spiritual man of you. You have to teach yourself. Your growth must come from inside. Therefore help you can, but do not destroy. There is no other teacher to you than your own soul. Recognise this".

From this it becomes clear that practical aspects of philosophy of yoga has to be studied and practiced by every individual himself after making a detailed and deep study. However, since there are innumerable types and varities of minds in people it is difficult to advise which type of yogic practice that would suit to each individual. Therefore broadly speaking there are four types of yogic practices which have been described in yogic treatises; especially in one of the most practical books—the Bhagavad Gita. They are : 1. Karma yoga for those who believe in action. They always want to work and show tremendous physical and mental energy to work hard to achieve their goal. 2. Bhakti yoga for those who are emotionally highly active and who show their intense love to the God Almighty and the nature in General. 3. Jnana yoga for those who are highly intellectual and who have the capacity to analyse every aspect of life and its philosophy in great detail. 4. Raja yoga for those who are greatly interested in the study of the body mind relationship in great detail. Through this one can know the eternal forces those are responsible for keeping the body-mind in firm union. By this one can gradually develop a power to have a voluntary control over all the internal activities of the human system for the betterment of himself and the world over. However, whatever type of yogic practice one adopts depending upon the psychosomatic formation of each individual, he has to practice the same method regularly and uninterruptedly if he wants to get over all the disturbing detractions of the mind. Thus Patanjali says"

अभ्यासवैराग्याभ्यांतन्निरोधः
(Yoga sutra, 1–12)

One has to practice all these methods of yoga regularly and without expecting anything in return. One has to practice them for the sake of getting a tranquility of his own mind and also for the benefit of humanity as a whole. If one determins to achieve such a goal there are many avenues through which he can serve the humanity. Although there are large number of Upanisads and other books which describe these methods in great detail. The Bhagavad Gita is one of the most concise and practical books which describe these methods in a most practical manner. Hence we have extracted only a few important verses for each type of yogic practice. However, those who want to study these matters in greater detail they are referred to the Bhagavad Gita with its many commentaries. For the sake of uniformity and brevity we have mostly referred to the commentary made by Sri Swamy Chinmayananda and there are others which give the explanation even in greater detail. Towards the end we have also included few other topics which we felt are important for every one to know and also to complete the topic. If one follows these principles scrupulously in every day life he can not only live happily but also can devinise his life in such a way that he can do maximum good to maximum number of people living in this world.

## KARMA YOGA

We cannot get better references on Karma Yoga than in Bhagvad Gita and hence, we thought it better to reproduce some of them here to lay greater emphasis on the techniques and results of all varities of Yogic practice. Thus Shri Krishna says to Arjuna in the battle field of Kurukshetra—

सुखदुःखे समेकृत्वा लाभालाभौ जयाजयौ
ततोयुद्धाय युज्यस्व नैवंपापमवांप्स्यसि
(Gita, 2 : 38)

"You should develop the habit of eqanimity in your mind when you face a situation which leads to pleasure and pain, gain and loss, victory and defeat. Therefore fight it out in the battle and you are sure to win and will not incur sin" (Fig. 30–31).

Here Lord Krishna gives the adivse that one must maintain equanimity of body, mind and intellect whenever he faces an emergency. Thus pain and pleasure is the experience of intellect, gain and loss is the experience of mind and victory and defeat is the experience of body. We can bring such an equanimity through practicing Karma Yoga, where in we train our body, mind and intellect not to loose our balance in any provocative situation. Equanimity in all such mental challanges is a factor to ensure true success in life.

Further Gita says—

कर्मण्येवाधिकारस्ते मा फलेषु कदाचन ।
माकर्म फलहेतुर्भूमति संगोऽस्त्वकर्मणि ।
(Gita, 2 : 47)

"You have a right only in doing your work, never on the fruits of your action. Your motive should not be the fruits of a particular action nor you should engage yourself to in action."

From this it becomes clear that the man following Karma Yoga will always try to perform his duties in the following manner: (1) He will mainly concern with his action alone in any given opportunity, (2) He will not waste much time in thinking about the ultimate outcome of results, (3) He will not be motivated for his action by a definete result for a given action, (4) He will not think of the result without doing anything about the action. In short for Karma Yogi the work itself is his reward and he gets himself engrossed with the joy and satisfaction of a noble work done." In this connection Chinmayananda says "Almost all of us refuse to undertake great activity fearing failure that might happen and even those who dare to take noble endeavours invariably become nervous when they finish it, again due to their inward dessipation. Avoid such wasteful expenditure of mental energy; work with the best that is in us, all dedicated to the noble causes of the work undertaken. This is the secret prescription for work in high inspiration and such work must always end in brilliant success. That is the eternal law of activity in the world."

"Here is call to man not to waste his present moments in fruitless dreams and fears, but to bring his best, all the best in him to the present and live vitally every moment. And the promise is that the future shall take care of itself."

Unless we follow these principles both in our daily thinking and action no worth while achievements can be obtained in one's life time and this is the main principle the great men in the world followed to achieve their cherished goal.

दुःखेष्वनुद्विग्नमनाः सुखेषु विगतस्पृहः
वीतरागभयक्रोधः स्थितधीर्मुनिरुच्यते ।
(Gita, 2 : 56)

"He is considered as a man of steady wisdom who is not deterred by adversaries, who does not cling to pleasure and who is free from excess of love, fear and anger."

In every day life one will have to be steady in his wisdom and also in his dealing with others, both at the emotional and intellectual level. Too much of fluctuation in the emotional state in a given circumstance always makes a man unsteady which will put him to great difficulties in achieving his desired goal. On the other hand if one is stable and is undisturbed in sorrow or in joy, and remains unattached to any one, fearless and gives up the anger in any adverse situation, he becomes the master of all situations and attains many things, in his life inspite of all the impediments; such is the case in the biographies of most of the great men. While ordinary men would become perturbed under many provocative situations, such greatmen usually remain steady, think about and take decisions to act without giving rise to much mental perturbation. Thus a man with steady wisdom is not distressed by calamities such as that occurs from disorders of his own body or those of others closely connected with him.

Similarly he does not become much puffed off by the pleasures or happiness that be gets by gaining something through internal or external means. Unless a man remains steady

**Plate III**

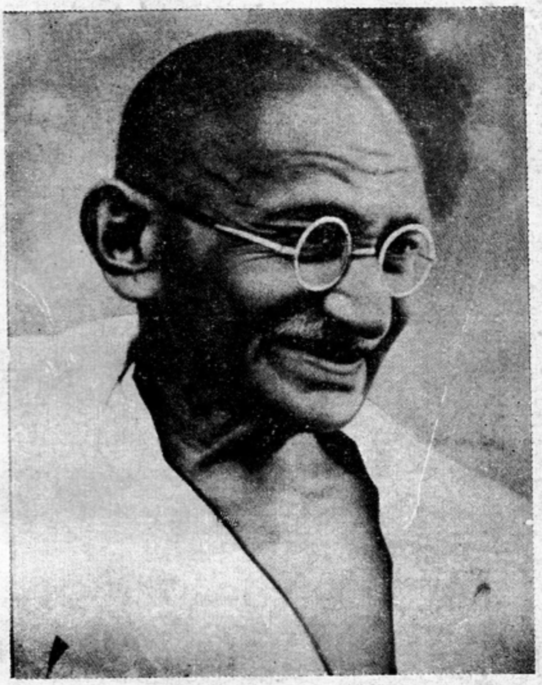


Fig. 30 : Mahatma Gandhi – A Karma Yogi in the field of Social reform.

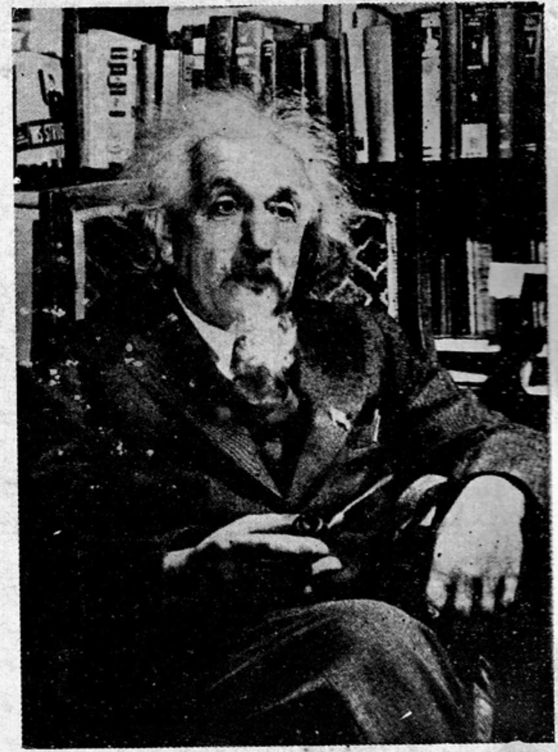


Fig. 31 : Albert Einstien – A Karma Yogi in the field of Scientific research.

in wisdom and shows to others that he is steady in all his the dealings he cannot achieve much during his life.

ध्यायतो विषयान्पुंसः संगस्तेषूपजायते
सङ्गात्संजायते कामः कामात्क्रोधोऽभिजायते
क्रोधाद्भवति संमोहः समोहात्स्मृतिविभ्रमः
स्मृतिभ्रंशाद्बुद्धिनाशो बुद्धिनाशात्प्रणस्यति ।

(Gita, 2 : 62, 63)

"When a man thinks of getting or attaining some object, he gradually gets himself fully attached to it. From such an attachment to the object desires crop in and from desire arises anger. As the anger increases one gets into complete confusion and from such a severe state of confusion he gets loss of memory and such a loss of memory he gradually looses his intellegence and from lack of intellegence he gradually becomes dead in the intellectual field."

Both these verses give us the reason how and why people fail to attain their goal by wrong thinking, planning or due to false imagination. Therefore a correct and creative thinking is most essential if one wants to succeed in his life. However if one constantly thinks in his mind of attaining some sense objects such as desire to eat sweets, the consistancy of thought creates in us an attachment for the objects of our thought–the sweets. When more and more thought is directed towrds our object, it becomes a burning desire to have and enjoy sweets. When we see some obstacles in getting our desired object-sweets, we become angry. An intellect fumed with anger comes to experience confusion due to which one looks to all of one's past memories as to how and in what way one got over his obstacles in the past in getting one's desired object-sweets. Any one excited with anger looses all his balance and forgets all his relationships with others like his seniors, parents, teachers and juniors etc. In a fit of anger, there is a severe emotional and mental disturbance which completely deludes the intellect from having sense of proportion and sense of relationship of the things around it. When such a descriminative power of intellect or "conscience" is lost, the man becomes nothing but a two legged animal with no sense of proportion or dignity which guarantees for himself a complete intellectual distruction.

रागद्वेषवियुक्तैस्तु विषयानिन्द्रियैश्चरन् ।
आत्मवश्यैर्विधेयात्मा प्रसादमधिगच्छति ।।

(Gita, 2 : 64)

"On the other hand a self restrained man with his sense organs fully under control and free from both attraction and repulsion attains peace."

Thus the man of wisdom with perfect self control of his sense organs and mind moves among all the sense objects of the world with neither too much of love nor too much of aversion for them. When the mind is trained in such a manner, the disturbances and agitations caused by attachment of the sense organs are immediately brought under control. Such a condition of mind is called peace and tranquility, which every body must constantly strive to attain in life.

प्रसादे सर्वदुःखानां हानिरस्योपजायते ।
प्रसन्नचेतसो ह्याशु बुद्धिः पर्यवतिष्ठते ।।

(Gita, 2 : 65)

"In such a peaceful state, all pains are destroyed and in a person with such a tranquil and pleasant mind, the intellect becomes steady."

Thus it is well known that in tranquility all sorrows are destroyed. Similarly a peaceful mind is the most important prerequisite for happiness. When one experiences happiness with tranquil mind, his intellect soon gets itself fully established to do any type of highly specialised intellectual work.

नास्ति बुद्धिरयुक्तस्य न चायुक्तस्य भावना ।
न चाभावयतः शान्तिरशान्तस्य कुतः सुखम् ॥
(Gita, 2 : 66)

"The unsteady man cannot get the knowledge and wisdom nor such a man can devote himself for meditation. The person who does not meditate cannot get peace and one has no peace cannot get happiness."

Thus unless a man has peace of mind, he will not have the intellectual leisure for the self development of culture and spirit. Without such self evaluation of life periodically with clear descriminative analysis, we cannot attain our goal. We will have to find out our faults and we should try to rectify them timely. Such a concentration and meditative approach to our life and its goal will greatly help us to get not only peace but also the happiness.

Therefore, we have to get rid of all our previous impressions before we can walk in the path of real knowledge, which we can attain by a constant practice. Further by mere renuciation of action we cannot expect to attain perfection. Running away from life is not the way to reach the highest goal of evolution. We have to continuously strive to get rid of the bad part of our life and try to get into the process of purification of our inner life continuously to reach ultimately the spiritual destination of self discovery. Once this is achieved, we can always be peaceful, happy and contended.

न हि कश्चित्क्षणमपि जातु तिष्ठत्यकर्मकृत् ।
कार्यतेह्यवशः कर्म सर्वः प्रकृतिजैर्गुणैः ॥
(Gita, 3 : 5)

None can ever remain even for a moment without doing any action. Because by nature of life every one born in this world would certainly be made to act constently as an inherent quality.

It should always be remembered that we cannot remain totally inactive even for a moment and the life is incompatable with such a state of complete inactivity. Even if we are taking rest physically we are always alive and active mentally and intellectually except during the state of our sleep. Therefore not to act during our life time is to disobey the law of nature and produce deterioration in our intellectual, cultural and spiritual status. Therefore, it is advised to all that every one should act vigourously and continuously with right attitude of mind and not to waste his energy continuously, without achieving the goal of life.

नियतं कुरु कर्म त्वं कर्म ज्यायो ह्यकर्मणः ।
शरीरयात्रापि च ते न प्रसिद्धयेदकर्मणः ॥
(Gita, 3 : 8)

You must perform the duties allotted to you every day, for action is superior to inaction. Even from the point of view of maintaining a good bodily health, you must attend to your duties regularly because it would not be possible for you to maintain a good health by inaction.

Usually duties of a person consist of obligatory function at home, in his office, and in the society at large. In case we fail to perform our duties in any one or all the spheres of our activities expected of us, it would be called as inaction. Here we are warned that if such an inaction is allowed to continue partially or fully, it may not be feasible for us to maintain a good bodily health. Such an inactivity or inertia in our part would lead not only to deterioration in the activity of the house, the society and nature as a whole, but also would lead to the degeneration of the person himself both in the physical and intellectual field. Therefore the work of such a nature should always be done to the community by sacrificing all his personal comforts in the spirit of co-operation and self dedication and with no personal attachment to any such activity. Then only it will be appreciated by all and the performer of such an activity will be called Karma Yogi.

प्रकृते: क्रियमाणानि गुणै: कर्माणि सर्वश: ।
अहंकारविमूढ़ात्मा कर्ताहमिति मन्यते ॥

(Gita, 3 : 27)

"By the very nature of our existence all of us are destined to perform all the functions which we are doing every day. But, a person whose mind is filled with ego and ignorance thinks that he is the doer of all such actions.

It is very often seen in the society that any action that one performs for the good of the people, say an opening of a school or hospital, he thinks that he is doing this services out of his own efforts. But in reality it is not he who is doing anything new. In fact any one who is placed in such a position would have done a similar service. Therefore doing of such a service does not give him any credit nor he has done any special favour to any one. It is by nature that any one placed on that position would have done such a service and therefore no one should develop pride as a result of false ego. In short, we are all destined to do certain activities by nature which every one would be doing placed in a particular position.

It is only a fool who thinks that he has done it and such a foolish thing usually originates from our false ego, Therefore no one should ever state that it is due to his efforts that some thing new has been developed, but it is only the nature which gets the things done through us and we should always rembember that our personal contribution for such a new development is insignificant. Then only we will develop a humility at the end of any of our achievements and the same would be greatly appreciated by all the people the world over,

काम एष क्रोध एव रजोगुण समुद्भव: ।
महाशनो महापाप्मा विद्धयेनमिहवैरिणम् ॥

(Gita, 3 : 37)

"Our main enemy of action is the desire and the anger, born out of rajoguna which engulfs all the results of the good work that we do every day."

It is now well known that the extreme desire to have certain thing if denied would ultimately lead to anger. In fact a continuous agitation of the mind leading to an uncontrollable impatience to gain something is called desire. When such an emotional set up gets itself obstructed from reaching its desired goal, then one becomes very much agitated over it, it is then called anger. When the desire accompanied with anger sets in, our emotion becomes completely succumbed to them, just as we succumb to the enemy when we get ourselves defeated. Therefore in all our activity of life, we should be free from desire and anger in the interest of saving ourselves completely from the tyranny of the enemy of our mind.

इंद्रियाणि मनो बुद्धिरस्याधिष्ठानमुच्यते।
एतैर्विमोहत्येष ज्ञानमावृत्य देहिनम् ॥

(Gita, 3 : 40)

"The seats of such internal desires are the sense organs, the Mind and Intellect and they are confused by the desire oriented wisdon in the body." In this it has been described that there are three places in the body where different types of desires in different froms function to destroy the peace and happiness of our inner life. At first the desire oriented sense organs which function in such circumstances without any restraint of different attractive sense objects. Secondly when such sensory stimuli reach the mind through sense organs, the mind also becomes a breeding centre for agitation and emotional imbalance created by the desire. Thirdly the intellect working with memories of past enjoyment of sense organs, and the Mental attachment it had entertained, becomes yet another seat from where the desire directs its activities all round. Thus these are three main head offices, from where our inner enemies with a constant mental agitation and with uncontrollable impatience function to the detriment of our entire life.

Therefore at first rerstrain the sense organs so that one may be able to finally throw away the inner enemy—"the desire", without much difficulty.

इंद्रियाणि पराण्याहुरिन्द्रियेभ्यः परं मनः
मनसस्तु पराबुद्धिर्योबुद्धेः परतस्तु सः ।

(Gita, 3 : 42)

"It is said that sense organs are superior to the body, and the mind is of greater importance than sense organs. The intellect is more superior to the mind and he the Atma or Soul is even more importance than the intellect."

Such an understanding of hierarchy of the psychosomatic constitution is very important in order to control these things one by one, by the constant practice of meditation. Of course one will have to start with the similar thing such as controlling of sense organs, then the mind and then the intellect by the supreme state the "consciousness". Even in the sense organs, at first one should control the lower most sense organ, the skin through which we constantly desirous of coming in contact with others especially of the opposite sex. Then the next comes the taste, through which we constantly desirous of eating many tasty foods or drinks. Then our desire to smell many perfumes or other smelly things should be restrained. The auditory organ can then be controlled by avoiding to listen too many songs or other exciting things. The visual sense should then be controlled by avoiding too much desire to see good things and not to be too much excited over them. By constant practice one can gradually get over all the desires of the sense organs and then again gradually one tries to restrain the mind and then the intellect. Lastly one restrains the self by self by a constant practice. All these things can be attained only by constant practice through Meditation the Technique of which has already been described elsewhere.

असक्तबुद्धिः सर्वत्र जितात्मा विगतस्पृहः ।
नैष्कर्म्यसिद्धिं परमां सन्यासेनाधिगच्छति ॥

(Gita, 18 : 49)

"He whose intellect is not attached with anything, who has won over his self consciousness, whose desire has already gone, and he through his renunciation, attains the supreme state of freedom from action."

According to Gita self restraint and freedom from desire are the two most important prerequisites for attaining our highest spiritual goal. Therefore in everything that we do we should show our non-attachment spirit. Because the moment we show our attachment, the sensory organs and the mind get themselves agitated and would try to get the full satisfaction for each of them. If one does not show any attachment and does nos desire to have any such attachment, his intellect remains clean and it carries on its function most sincerely and whole-heartedly without expecting anything out of such an action.

## Plate IV

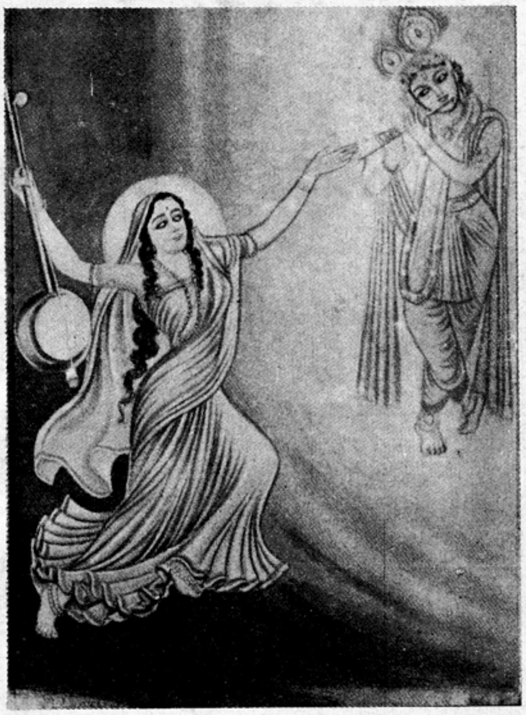


Fig. 32 : Meerabai – a well known composer of Bhakti songs of India which are very popular even today.

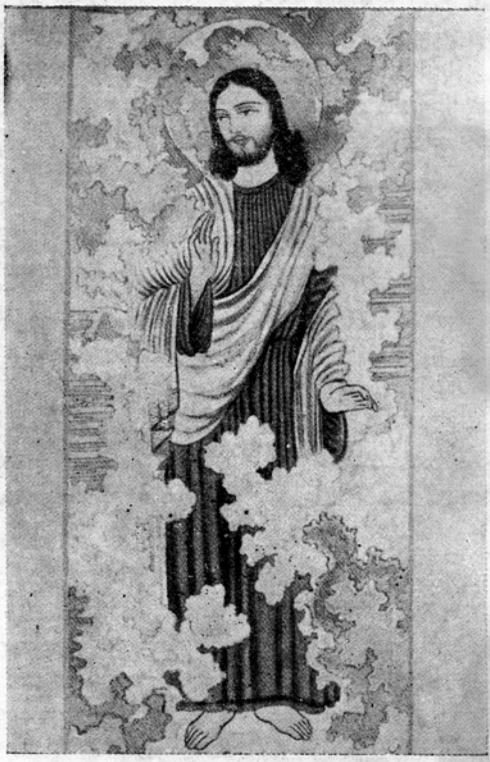


Fig. 33 : Jesus Christ – whose prayer to god almighty is too well known to all.

Such a person should have subdued his ego and has given up all the desires and also that he has completely renunciated the fruits of action. It is such a person who ultimately attains the supreme state of freedom which leads to external peace and happiness.

This is the ultimate goal every one should aim at to achieve through Karmayoga. All persons interested in achieving such a goal should study this subject in sufficient detail and put their views into action in their daily life in order to achieve this goal. It is nothing that is impossible in one's life and one reaps the results of his own performance during his life time. This is what Karmayoga teaches us to realise and therefore we should always plan and execute our life's programme accordingly within the best circumstances available to each one of us.

## BHAKTI YOGA (Fig. 32 & 33)

As already described earlier there are several methods to reach the peak of our goal, just as there are several routes through which one can climb the top of Mount Everest. In the same way the Bhakti Yoga, or Yoga through love of God is the other pathway through which one can attain his goal during his life time. The Bhagawad Gita has given some details of the technique of Bhakti Yoga and we have here briefly discussed some of them. Those who want to know more about it are advised to read the originals and their extensive commentaries.

तस्मात् सर्वेषु कालेषु मामनुस्मर युध्य च ।
मय्यर्पितमनोबुद्धिममिवैष्यस्यसंशयम् ॥

(Gita, 8 : 7)

Therefore at all times remember me and fight the battle of life. By fixing your mind and intellect in me alone you shall certainly attain my position. It is a well known fact that every person reaches his goal of perfection by following his own thoughts and therefore he should always try to divinise his thoughts before taking any specific action in any direction. In this connection Swami Chinmayananda states :-

"No religion can continuously serve the society unless it gives its faithful followers instructions and guidance on how best they can live their day to day life. Here is a simple instruction by which not only the standards of living can be raised, but the very standard of living can be divinised."

"Ordinarily a major portion of the mind all the time wanders into the jungles of dreadful fears, or into the caves of jealousies or into the deserts of imaginary possibilities of failures. Instead of this wasting the total mental energy and dynamism, Krishna is advising here that a truly successful man striving to achieve the highest both in the world of plurality outside and in the realm within should rest his mind in the soft and peaceful feet of truth. Then he can pour out the entire wealth of his capacities into the action in hand and thereby assure to himself the highest laurels both here and hereafter."

Chinmayananda further continues :

"A truly educated man never forgets his education. It becomes part and parcel of his very nature and in every thought, word and action he brings out the fragrance of his education. So too the man of constant awareness of his divine self will be acting in the world as a master mind all his actions soaked in selflessness, all his thoughts flavoured with love and all his feelings matured with kindness. This is the secret by which the Vedic civilisation enchanted the world of their times and compelled the adoration of all later generation."

From all these statements it becomes clear that the man will have to plan his future and execute it by constantly thinking and acting with a firm belief that it has a divine backing since it has accompanied with selflessness, love and kindness. Unless we work hard with a full hope of divine backing, we don't get the full confidence and firmness in our action. This is a valuable spiritual outlook of life to reach our desired goal.

अभ्यासयोगयुक्तेन चेतसा नान्यगामिना ।
परमं पुरुषं दिव्यं याति पार्थानुचिन्तयन् ॥
(Gita, 8 : 8)

With the practice of meditation, one tries to restrain the mind from going hither and their and by fixing the mind in constant contemplation of achieving the supreme goal he becomes single pointed in his concentration. This is an important technique of prayer (भक्ति योग) through which the Gita has explained the Methods of devotion and surrender. By this practice the devotee develops single pointedness in the mind which helps to integrate the body with sense organs, mind and intellect. With such well adjusted instruments of perception and comprehension the intuitive realisation of the ultimate goal becomes easy. In fact a realisation of such a goal can be comprehended and achieved within a reasonable period of time, if the fully prepared mind is directed inwards to concentrate upon his goal with great steadfastness and determination. In this connection Chinmayananda states—"The strength acquired by the meditator, when he meditates upon the supreme (desired goal) regularly for a long period of time is the strength, the power of Yoga that is indicated here. This is nothing other than the inward strength, the inward fire that grows when the mind is withdrawn from its endless agitations and the intellect is peacefully rested upon its easy contemplations. In short the meditator in a relatively short time discovers in himself the wealth of Mental equipoise and an indescribable ready efficiency to bring his entire mental equipment exclusively for the contemplation............"

These are some of the basic principles of Bhakti Yoga through which the sincere and earnest person interested in the practice of this type of yoga can achieve his goal by a constant contemplation and practice.

सर्वद्वाराणि संयम्य मनो हृदि निरुध्य च ।
मूर्ध्न्याधायात्मनः प्राणमास्थितो योगधारणम् ॥
(Gita, 8 : 12)

After restraining all the sense organs after strictly confining the mind in the heart and after fixing the self in the head one engages himself in the practice of yoga (Bhakti Yoga).

As already stated earlier, Gita again repeats the technique of yogic practice for clarification. Thus through the 5 sense organs the external stimuli reach the mind and produce agitation. In order to stop these agitations of the mind one will have to shut his sense organs through the process of discrimination and detachment Through these gateways not only the sense organs receive the stimuli, but also that through these very gateways the mind also runs out to wander among the sense organs. Once such organs are blocked, the mind automatically becomes blocked to divert its attention for an inward look.

It is also stated that one should try to continue the mind in the midbrain and hypothalamus. Thus even after controlling the sense organs one will have to make special effort to become free from the disturbances of previous impressions of pleasures and pains. Because it is known that the positive thinking of bright future always brings in a least amount of disturbance in the mind.

Whereas negative thoughts of bad experiences of the past bring into the mind a stormy condition of agitation and restlessness.

Thereafter one withdraws the mind—intellect complex totally from perceptions from outside, and thus fixes the same inwardly in the contemplation of the self and its divine thoughts. With such a state of mental and intellectual tranquillity the person becomes fit for chanting and meditating upon the monosyllabus 'Om'. This chanting is needed for those who cannot fully meditate on their object by their own efforts. Again Chinmayanada says here "Every meditator who can make an attempt at forgetting his immediate sensual surroundings and with the mind seen charged with joy and contentment who can bring that mind under the total control of his discriminative intellect, in short the one who can mentally chant "Om" with ease and enthusiasm and observe the raising "Om" waves in his otherwise silenced mind............is the fit student for the worship of "Om".

Here the chanting of such "Om" should be taken as word which has a definite and deeper significance for all the seekers on the path of meditation it should be followed strictly so that they can definitely achieve their higher goal within a reasonable amount of time.

ईश्वरः सर्वभूतानां हृद्देशेऽर्जुनतिष्ठति ।
भ्रामयन्सर्वभूतानि यंत्रारूढानि मायया ॥
(Gita, 18 : 61)

The God Almighty dwells in the heart of all the living creatures. His ellusive owner continuously revolves everywhere as if he is mounted on a machine. This stanza just states a fact that in order to find out a God one need not go to the temple, church or mosque, but if he is really interested he can see and realise in his own heart. Here heart does not mean a physical heart but it is meant psychological heart of cardiac centre of the brain. Such a person who realises the presence of God within his body gradually cultivates the divine qualities of a cultured human being such as with love, kindness, cheer affection, forgiveness, charity etc. Such a person not only remains active himself but also energises every one else who comes in contact with him, that is how the person with such divine qualities always radiates his energies in such a way that all who come closer to him become his disciples. Therefore every one should realise the possibities of developing these qualities in the interest of serving the humanity as a whole.

तमेव शरणं गच्छ सर्वभावेन भारत ।
तत्प्रसादात्परां शान्तिस्थानं प्राप्यसि शाश्वतम् ॥
(Gita, 18 : 62)

Therefore please surrender yourself to the God Almighty present in the heart of each one of us. It is only by his benevolent support that we can obtain supreme peace in an eternal state.

Such a surrender to the divine nature present in our body should not be a temporary affair and we should constantly strive to see that his presence is recognised by us constantly in every walk of life and at all the times of our activities. We dedicate every act of ours to this God Almighty, surrendering all our egoes to him and this act of ours in life which ultimately gives as an enternal peace.

पत्रं पुष्पं फलं तोयं यो मे भक्त्या प्रयच्छति ।
तदहं भक्त्युपहृतमश्नामि प्रयतात्मनः ॥
(Gita, 9 : 26)

"Who so ever offers me a leaf, flower, a fruit or water with devotion, I accept the offer which has been given to me with devotion and pure mind." By practicing the offerings to all others with pure mind and devotion one can certainly follow the spiritual path of self developments within a short period of time. Therefore :

यत्करोषि यदश्नासि यज्जुहोषि ददासि यत् ।
यत्तपस्यसि कौन्तेय तत्कुरुष्व मदर्पणम् ॥
(Gita, 9 : 27)

"Whatever you do, whatever you eat, whatever you give in sacrifice and whatever you practice as austerity, you do it as if you are offering to me." This means that we should carry on all our life's activities of physical, mental and intellectual levels by constantly remembering the supreme the Almighty. Thus Chinmayananda says "A devotee who can constantly remember in all his contacts in life the divine, he along is the one who can give to life the respect and reverence that it deserves. It is a law in life that as you give into life, life shall provide for you. Smile of life, the life smiles. Frown at life the life frowns at you; Approach life with due reverence and respect born out of the divine essence in It, life too shall learn to respect and revere the individual." "When all the activities are performed in the spirit of offering not only that our love for the supreme increases in us, but our entire life becomes sanctioned with noble and diviner aim."

This is the way we should remember the God Almighty throughout our life and remember and worship him constantly since he is always there looking at us and our activities continuously throughout our life time. By following this path of Bhakti Yoya, many well known people not only tried to reach their goal but also showed this path to all the followers of their generation.

## JNANA YOGA (Fig. 34 & 35)

This is another pathway or method of concentration through which also the true seeker can achieve his supreme goal. Here, the person attains ultimate goal by acquiring knowledge and wisdom by doing continuous study of the chosen subject for years together. By constant concentration and meditation on the knowledge acquired by the prolonged study, the person strives to see that he fulfils his life's mission within his life time. The Bhagwad Gita has discussed the method of such a Jnana Yoya in great detail and hence the same is given below.

तद्विद्धि प्रणिपातेन परिप्रश्नेन सेवया ।
उपदेक्ष्यन्ति ते ज्ञानं ज्ञानिनस्तत्त्वदर्शिनः ॥
(Gita, 4 : 34)

"Please realise that the great teacher-scholar who has realised the truth will be glad to impart you the knowledge provided you are prepared to learn from him through prostration, by questioning and by service."

**By prostration**

This is an important stanza in which the mental attitude and the intellectual approach, a true student must adopt to have an effective contact with his teacher to gain the maximum knowledge. It clearly says that such a knowledge of life can be gained by the students from the great teachers of repute by prostrations, by questions and by service. Here we should remember that the prostration does not mean a physical pose, but it indicates that the student should have an intellectual attitude of surrender to his teacher and also to be respectful and obedient when he approaches his teacher who has to instruct him about the secrete of life.

**By questioning**

This means that the true student must be vigilant enough to detect his own intellectual

**Plate V**

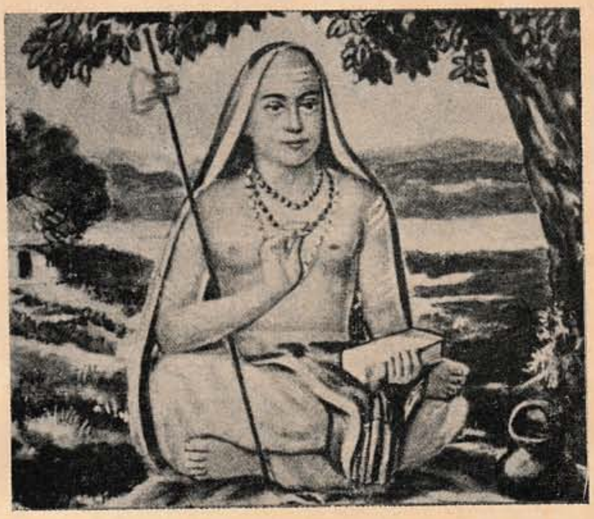


Fig. 34 : Shri Shankaracharya – one of the greatest thinker and philosopher of India; a typical example of Jnana Yoga.

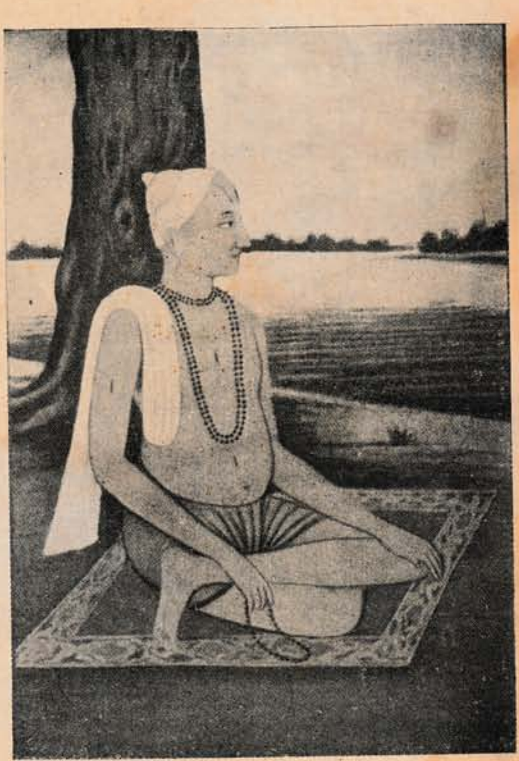


Fig. 35 : Shri Sant Tulsidas – who wrote his Tulsi Ramayan with full of Philosophical thoughts.

doubts while listening to the discourse of his teacher and he must be ready to raise his doubts by questioning which should be done with utmost respect, reverence and admiration.

**By service**

The real service of the student to the teacher lies in making an attempt on the part of the student to strictly follow the principles of life advocated and advised by his teacher. To lead a life indicated by his Master is the greatest act of service that an imperfect student can offer to the man of perfection.

Thus, when the teacher becomes fully satisfied that a particular student possesses above mentioned qualities, he imparts his instructions sincerely and whole heartedly all the knowledge that he possesses and which he has collected throughout his life time.

नहि ज्ञानेन सदृशं पवित्रमिह विद्यते ।
तत्स्वयं योगसंसिद्धः कालेनात्मनि विन्दति ।।

(Gita, 4 : 38)

"There is nothing more sacred than the like of the knowledge. He who has perfected Yoga himself through knowledge will realise this fact in his own life in due course of time."

As a result of self realisation through acquiring all the available knowledge in the world one reaches to the conclusions in due course of time that "There exists nothing in this world more noble and sacred than self knowledge."

In this regard Chinmayananda says "Self realisation is not a magic. It is not witchcraft or mesmerism by which we can gain a relief from our sorrows. God realisation is the final end of evolution, the fulfilment of existence. Just as no great living scientist can by a touch or with his teachings or with his blessing overnight convert an illiterate fool as great a scientist as himself, so too the spiritual perfection of a master cannot be transferred to an youth living grossly in his flesh. Each seeker has to struggle hard for himself, applying his best in liviug the life divine, where in the teacher can help, no doubt, a little more than the scientist can help his apprentice."

For attaining such a perfection no time limit has been given. However, those who practice various procedures sincerely and devotedly will attain the goal and experience the knowledge of the self within the shortest possible time.

श्रद्धावांल्लभते ज्ञानं तत्परः संयतेन्द्रियः ।
ज्ञानंलब्ध्वा परांशान्तिमचिरेणाधिगच्छति ।

(Gita, 4 : 39)

"The person who has great confidence and who has full control over his sense obtains the knowledge by devotion. Such a person having obtained the knowledge very soon reaches the eternal peace."

From this, it becomes clear that three qualities, namely faith, devotion and self control are the important necessity to be acquired before we can hope to acquire the diviner stature with knowledge and peace.

Faith should not be taken as "blind faith and unquestioned acceptance of any thing said to be originated from Divine sources, but the faith that has resulted from proper understanding of the truth from all sources, Devotion here means an undivided attention to achieve his goal. A mere study of scriptures will not help us in cleaning our inner self, but we have to understand and practice self, and we have to understand and practice of those advises. Thus Chinmayanana says."

As you think, so you become, is an incontrovertible law in life. Each one of us is but a fulfilment of our own thoughts. Thus it becomes, evidently clear that a "Sunday-

Religion" cannot make us divine for the rest of week unless we are ready to remember those idealisms and strive to live them sincerely all the 24 hours of every day. No ambition in life can hope to be gained by haphazard wishful thinking and even that is unaccompanied by sincere efforts it becomes sheer madness."

**Self control**

It is a well known fact that no true seeker of truth can achieve his goal unless he constantly strives to live in a spirit of self control. Usually it is the sense organs which seduce us away into the life of excessive sensuousness. The excess of sensous life and divine life are opposite to each other. Therefore, it should be fully realised that a seeker should learn and practice to live in a steady and constant control of sense organs.

If one strives to do all his activities with these qualities, one is sure to achieve the requisite knowledge to get in his life time the supreme peace in due course of time.

अज्ञश्चाश्रद्दधानश्च संशयात्मा विनश्यति ।
नायं लोकोऽस्ति न परो न सुखं संशयात्मनः ॥
(Gita, 4 : 40)

"The ignorant who has no faith, and who doubts in everything in this world is bound to be destroyed. For such a person who doubts on everything all the time there is no happiness either in this world or in the other."

Here the matter has been further clarified stating that those who have not studied or developed the knowledge of self will ultimately be destroyed by themselves. Further, it is stated that those who have not acquired the knowledge of the self through whatever the means that is available to them and those who have no faith in themselves in their capacity to achieve the goal, and who constantly doubt everything that is around them, will never be able to achieve their goal. In fact they will gradually destroy themselves leading to their own end. It has been seen that such men are psychologically incapable of enjoying any situation in view of the doubting tendency in them all the time which would poison all their experience. Therefore, it is essential that not only we should acquire all the knowledge from all the sources available to us but also develop intense faith in ourselves and in our capacity to achieve the goal.

तस्मादज्ञानसंभूतं हृत्स्थं ज्ञानासिनात्मनः ।
छित्त्वैनं संशयं योगमातिष्ठोत्तिष्ठ भारत ॥
(Gita, 4 : 42)

"Therefore please remove the self born ignorance present in your heart with strong weapon of knowledge of yoga and get up, arise to face the situation of the world." This is the advise Lord Krishna had given to Arjuna and the same can be taken as advise for all of us who are struggling hard in the battle of life to achieve our goal.

Therefore please get up and act well in a spirit of renunciation, so that we can get more and more inner peace through the purity of mind and action which is the final aim of everyone born in this world.

ज्ञानविज्ञानतृप्तात्मा कूटस्थो विजितेन्द्रियः ।
युक्त इत्युच्यते योगी समलोष्ठाश्म कांचनः ॥
(Gita, 6 : 8)

"A person who is satisfied with his knowledge and wisdom, who remains firm and who has controlled all his sense organs to whom there is no difference in a piece of an earth or a stone or gold, is called a well balanced yogi."

Here one should remember that the knowledge gained through study is called "Jnana" and the personal experience of the knowledge gained by seeker himself is called as

"Vijnana." Such a person who has gained both knowledge and wisdom of the life of self both by the study of books and by experience, and who has then conquered his sense organs in such a way that he remains firm in all occasions of pain and pleasure, gain and loss, is really called a Jnana Yogi. Further such a person can by his continuous efforts attain the goal of self realisation in due course of time.

बहूनां जन्मनामन्ते ज्ञानवान् मां प्रपद्यते ।
वासुदेवः सर्वमिति स महात्मा सुदुर्लभः ॥
(Gita, 7 : 19)

"At the end of many births, the men of knowledge reach the Almighty, thinking that it is the inner most self. Such a great soul or Mahatma is very hard to find in this world. From this it becomes clear that it is really difficult to find pure men of wisdom in this world. In reality, even among those who have fully developed mental and intellectual capacities only very few venture to study the standard texts to understand the subject. Even amongst those who fully study the subject, comparatively very few who would try to live upto the standard of life mentioned in the texts. Therefore it is abundantly clear that only a very rare few can ever reach the highest goal of discovering the true divine nature of their life,

श्रेयोहिज्ञानमभ्यासाज्ज्ञानाद्ध्यानं विशिष्यते ।
ध्यानात्कर्मफलत्यागस्त्यागाच्छान्तिरनन्तरम् ॥
(Gita, 12 : 12)

"It is stated that the knowledge is better than the mere practice. However meditation is even better than knowledge. Renunciation of fruits of action as much better than the meditation, because by renunciation one can immediately get peace."

Here one should realise that the knowledge of intellectual and spiritual implication of Yogic practices is much more important than mere external yogic acts or devotional performances. Even more important than the mere knowledge is the concentration and meditation upon the very knowledge that we have gathered. Such a concentration and meditation is only possible if we have a complete peace of mind, which is not possible if our minds are agitated over our future. Therefore renunciation of all the fruits of action is more important for achieving peace than even meditation. Hence one mnst develop the practice of renunciation all the time in order to achieve exeternal peace as quickly as feasible. With this knowledge when one tries to meditate, one is assured of definite success in self development and a steady progress in life.

### The mind

Here a question is asked by Arjuna in Bhagavad Gita.

चञ्चलं हि मनः कृष्ण प्रमाथि बलवद्दृढ़म् ।
तस्याहं निग्रहं मन्ये वायोरिव सुदुष्करम् ॥
(Gita, 6 : 34)

"Please realise the mind is restless, turbulent, strong and unyielding. Therefore it is realised that it is very difficult to control such a mind just as that of the strong current of wind.

Here Arjuna asks his friend Krishna to clarify as to how one can control the mind and feel equanimity in every type of life situations such as pleasure and pain and other similar occasions. Because the mind is very turbulent and unsteady and once it attaches itself with a sense-object, it gets so powerfully combined to it that it becomes difficult to pull it back from it. Therefore arjuna asks a very pertinent question as to how one can face such a worldly situation in his every day practice so that he can strive to get a better control over his mind. In reply Krishna says :

असंशयं महाबाहो मनो दुर्निग्रहं चलम् ।
अभ्यासेन तु कौन्तेय वैराग्येण च गृह्यते ॥

(Gita, 6 : 35)

"Undoubtedly one should realise that it is difficult to control the restless mind. However by a constant practice and by renunciation one can restrain the mind." Here initially the author admits that the mind is very difficult to control and the goal of perfect tranquility cannot be easily achieved. But later on he says that the mind can be brought under control through constant practice and renuciation. Here renunciation means giving up of all our attachements to the sense objects of the world and also not expecting anything of the fruits of our action. Usually there are two causes of agitation of thoughts in the mind which makes it uncontrollable. However by the repeated practice of detachment and renunciation one can meditate at depth of controling the mind. In short we should let our attachments to sense objects drop off at their own accord as a result of our intellectual understanding at the higher plane and its true estimation of real value. If we go on practicing this detachment sincerely from the bottom of our heart every day in a greater or lesser degree, sooner or later the mind will come under our full control depending upon our devotion and confidence in our techniques.

Such a mind can be disturbed by several causes which ultimately lead to many abnormal manifestations. In this connection Patanjali states.

अविद्याऽस्मितारागद्वेषाभिनिवेशाः पञ्च क्लेशाः ।

(Yoga Sutra, 2 : 3)

'Mental agitation leading to miseries of life are caused by ignorance, false identification of self, love, enmity and an intense desire for continuation of life.

Here the main cause of such mental agitation is the ignorance with regard to the various problems of life such as one thinks of temporary phase of life as eternal and permanent one. Similarly false identification of himself or things which do not truly belong to him is another cause of mental disturbance. Thus too much of enjoyment or too much of pain would also lead to agitation of mind. Thus constantly seeking pleasure or avoiding pain may be the important cause of mental disturbances in many persons who otherwise look normal. Lastly the intense desire to live securely and continuously cling to whatever one possesses is another cause of mental agitation. Thus each one of these five things can produce the mental agony or disturbances but in a person more than one cause may be operating leading to enormous and continuous disturbance of mind. They should be avoided as far as possible and one should try to keep aloof from them with the help of yogic practice. What are the internal causes of agitation ?

व्याधिस्त्यानसंशयप्रमादालस्याविरति-
भ्रान्तिदर्शनालब्धभूमिकत्वानवस्थितत्वानि-
चित्तविक्षेपास्तेऽन्तरायाः ।

(Yoga Sutra, 1 : 30)

Now Patanjali gives the various inborn or internal causes of distractions and mental agitation. They are "disease, dullness, doubt, carelessness, laziness, disinterest, delusion, non-attainment of desired objective, and instability". According to Rohit Mehta, the first five causes are due to the disturbances in the Tamo Guna and the remaining four causes starting from disinterest are due to disturbances in the Rajo Guna. Thus all these causes originating partly from the body and partly from the mind lead to various manifestations of psychosomatic disturbances. The only way to overcome these obstacles and difficulties is through the practice of yoga, especially the dharana, dhyana and samadhi. Now he described the outer manifestations of the persons who are facing these obstacles leading to the development of some of the stress diseases.

दुःखदौर्मनस्याङ्गमेजयत्वश्वासप्रश्वासा
विक्षेपसहभुवः

(Yoga Sutra, 1 : 31)

Thus the symptoms of such disturbed minds are sadness, mental agony, nervousness and rapid breathing. All these manifestations develop when this inborn agitation reaches an advanced stage step by step and if one wants to overcome this he has to remove the cause in the initial period. Thus Taimini says "It will be clear to any one who understood this theory that there can be no cheap but effective solution of problem of human suffering except through the conquest of the great illusion. As long as this is not achieved and the mind remains subject to the illusion of lower life, suffering and misery must remain and the outer symptoms which reflect the disordered condition of the mind and continue to appear in greater or lesser degree" from this one can say that if one wants to overcome these symptoms, he has to constantly practice yoga in some form or the other and other behavioural adjustments in the society:

मैत्रीकरुणामुदितोपेक्षाणां सुखदुःखपुण्यापुण्य
विषयाणांभावनातश्चित्तप्रसादनम् ।

(Yoga Sutra, 1 : 33)

One cultivates a pleasant mind if he practices friendliness, compassion, happiness and indifference towards pleasure, sorrow, virtue and vice respectively.

There are some of the methods by which one can overcome the mental agitation and disturbance in one life. No amount of preaching or planning will help one to get over the stress and strain of modern life unless one changes the mental attitude as suggested above towards every day happenings in the society. Normally we react towards happenings around us very sharply leading to severe mental agitation. Whereas others may become so cold and unresponsive that do not react at all. Both these behaviours are very abnormal. In fact what we need is the balanced approach in all situations of mental stress in the form of proper equilibrium of mind and freedom from unnecessary entanglements. Unless one tries to maintain a harmonious relationship with others he cannot have a good peace of mind which is an essential prerequisite for an ensured success of yoga.

तपःस्वाध्यायेश्वरप्रणिधानानि क्रियायोगः ।

(Yoga Sutra, 2 : 1)

Those who want to practice yoga must fulfil certain basic preliminary qualities which are to be acquired and then practiced by every one and throughout the period of life. They are, austerity, self study and self surrender to God Almighty. Here austerity means putting away all the non-essentials of life and to lead a simple, non-ostentatious living. It is emphasised here that it is only the man of simple life who will be able to bear the stress and strain of real spiritual living. Along with such a simple living one will have to continuously make self study in the form of not only reading useful books, but also to devote sufficient time for thinking of various problems of life. Thus in this connection Rohit Mehta states "For most people thinking never starts—they live on what other people have thought about. In our education process too, we are generally told "what" to think but never "how" to think. In this sutra. Patanjali asks the spiritual aspirant to begin thinking for himself. This indeed is self study." By simple living and high thinking one then surrenders to the God for the fulfilment of his plans and aspirations, By completing these preliminaries only one can actually practice all the methods of yoga with much benefit. Thus Patanjali says.

समाधिभावनार्थः क्लेशतनूकरणार्थश्च ।

(Yoga Sutra, 2 : 2)

Such preliminary practices are mainly meant to hasten the process of enlightenment and also to reduce the severity of mental sufferings and agitation whenever one faces some stressful situation. Thus these preparatory practices of simple living with austerity, self study in the from of one's own thinking and the surrender to the nature for the fulfilment of his plans and aspirations would certainly make the person to mentally face any abnormal situations of life with greater courage and strength. These practices will not prevent various processes of mental agitations, but they can certainly reduce their deleterious effects on the psychosomatic constitution of a person. As a result of this a person striving for ultimate enlightenment and bliss can reach his goal much earlier than others. Here it will not be out of place to mention about the definition of yoga as given by Patanjali.

योगश्चित्तवृत्तिनिरोधः ।

(Yoga sutra, 1 : 2)

He says "Yoga means control over the response of the mind." This means that the mind which is, as already stated earlier very unstable, becomes free from all the exciting tendencies on some provocation by means of yoga. If a mind or thought process of a human being becomes fully under control, without any reactive tendencies, our consciousness becomes pure and innocent with no trace of any conditioning at all. It is through such a peaceful and creative mind only that one can achieve the goal of life. Hence yoga is the most important instrument through which any human being wanting to elevate himself can expect to free his mind from all the distractions by restraining his own activities.

As already stated earlier while discussing philosophy that one of the basic requirement of attaining success in yogic practice is to do it regularly and repeating without expecting an immediate return.

Here Vairagya means a state of relaxation in the midst of tension and inaction in the midst of action. Unless we combine both these things the regular practice with no specific attachment we can not achieve our goal in the shortest possible time. What is the main purpose of practicing yoga ? Patanjali says :

योगाङ्गानुष्ठानादशुद्धिक्षये
ज्ञानदीप्तिराविवेकख्यातेः ॥

(Yoga sutra, 2 : 28)

By practicing various types of yoga one can reduce the impurities in the body and mind, which leads to illumination of wisdom and spiritual enlightenment.

It is clear from this Sutra that as soon as one cleans away his bodily and mental impurities through yoga, there occurs a spiritual illumination in the form of intuition. This inner light of wisdom in the beginning remains dormant, but gradually it becomes stronger and stronger till it becomes fully manifested as one continues to make progress with different levels of yogic practice. Therefore the continuous practice of yoga eliminates all the obstacles in the way of attaining of spiritual enlightenment and awareness of reality. What are these yogic practices ?

यमनियमासनप्राणायामप्रत्याहारधारणाध्यान
समाधयोऽष्टावङ्गानि ॥
(Yoga sutra, 2 : 29)

We have already dealt with earlier the details of these eight methods of yoga as described by Patanjali. They are namely 1. Self restraints (5 types), 2. Observances (5 types), 3. Physical exercises, 4. Breathing exercises, 5. Restraint on the organs of special senses, 6. Concentration of mind, 7. Meditation and 8. Contemplation. Out of these eight methods of first five methods are called external procedures mostly devoted to the improvements in the bodily functions. The remaining three are called internal practices which are mostly related to the sharpening and functional improvement of the mind. Therefore, if one wants to improve his life as a whole he should not end up only with the practice of only one or two types such as physical exercises or breathing exercises or even meditation unless one attempts all of them together one may not be able to achieve much. Thus if one practices only the external procedures, he may develop a good physical body, but one mental development may not be functionally good and efficient proportionately. On the other hand those who practice only meditation may be having a good intellectual capacity but may not necessarily have a good physical body. Hence there is a great necessity in the field of yoga to have an integrated approach in which all the eight types of practices are undertaken so as to have a balanced development of all the parts and segments of body and mind. Thus Patanjali says.

रूपलावण्यबलवज्रसंहननत्वानि कायसंपत् ।
(Yoga Sutra, 3 : 46)

By attaining perfection after doing regular yogic practices one can expect to achieve an excellent built of the body which would look beautiful and strong and which would be hard and yet would maintain its elasticity. Therefore the practice of eight methods of yogic procedure brings at first excellent body built with beauty of form, grace of movement, strength of dignity, and elasticity of the limbs. Such a beautiful body should not bind us to achieve the ultimate goal of yoga and hence we should strive for the development of mind also simultaneously. Similaly Patanjali continues to emphasise that by yogic practice one can gradually attain the strength to control the sense organs by developing a type of restraint in respect of each sense organ. Thereafter sooner or later he gradually develops necessary strength to have a full control over the mind.

Here one can say that in Hatha yoga one tries to build the body which ultimately leads to the control of sense organs and mind. Whereas in Raja yoga the ultimate aim is the control of the mind which also brings about the functional improvement in the built of the body and sense organs. Patanjali's emphasis is more on the latter than on the former techniques.

Such an attainment of remarkable psychic power depends upon the following factors :

जन्मौषधिमन्त्रतपः समाधिजाः सिद्धयः ॥
(Yoga Sutra, 4 : 1)

Attainment of such extraordinary psychic powers through yoga also dependent upon 1. Hereditary 2. Medicines 3. Chanting of mantras, 4. Practice of austerity and 5. Samadhi or contemplation. Why some people attain their goal very quickly whereas others take a long time to achieve the goal of developing their psychic powers. Thus the heredity plays an important role in some people, who from their very birth devote sufficient time for the attainment of their goal. Similarly such a process can also be hastened by taking appropriate psychotrophic drugs. Though this is feasible as one sees after LSD, it is often fraught with many dangers. Hence this occasional harmful effect should be kept in mind while making use of this procedure. Similarly the use of Mantras and Tantric methods may be of help in hastening the process of attaining mental perfection. The practice of austerity is the method which may also hasten the process. But the practice of Samadhi or contemplation seems to be the most appropriate and sure method by which one may attain the goal in all probability within the reasonable amount of time. Thus this explains the fact as to how and why different people by following different methods could achieve the same goal. This should put at rest the claims of superiority of one method over the other, since all of them ultimately reach the same goal. Further the combination of these methods is possible in one person and hence he will have an added advantages to achieve his goal rather quickly. Hence depending upon the circumstances one strives hard to attain goal as best as he can by following any or all these methods.

Here one must realise that the one who acts rightly in the perfect state can never get grief in the future date because it is well known that the future is but a product of the present and the good is that which yields nothing but success and joy in the future. Similarly one should also remember that the present is the product of the past and by every thought and action we are creating ourselves the blue print of our own future. Therefore, it has been completely assured that *"The doer of good never comes to grief."*

पार्थ नैवेह नामुत्र विनाशस्तस्य विद्यते ।
न हि कल्याणकृत्कश्चिद्दुर्गतिं तात गच्छति ।।

(Gita, 6 : 40)

"Neither in this world, nor in the next world, there will nor he can ever come to grief for doing such good service to others."

Thus it is boldly stated that one who is striving to help others is to go up culturally in the ladder and shall never come to suffer any real fall. On the ladder of the cultural growth, each step that is placed forward is an ascent toward absolute perfection of our life.

मनुष्याणां सहस्रेषु कश्चिद्यतति सिद्धये ।
यततामपि सिद्धानां कश्चिन्मां वेत्ति तत्त्वतः ।।

(Gita, 7 : 3)

"Amongst thousands of people only a few strive for perfection. Even amongst those who strive to achieve success only one per chance knows me in full (reaches the highest goal).

This stanza clearly indicates that why inspite of best efforts some still remain in the area of ignorance, because most of them do not try hard enough to achieve their goal and moment they face some obstacles or difficulties they give up their efforts. Hence they cannot reach the higher level of perfect knowledge and equanimity nor they can discover in themselves the necessary urge to evolve for higher status in their life. Thus, of the thousands who hear and understand the technique of self realisation and perfection, only a few sincerely apply themselves to live upto the higher level. Even among a thousand such sincere seekers only a rare few who can reach the highest goal of self perfection and perfect equanimity.

In fact there are only a few people who study sincerely all available literature on Yoga and get real knowledge of the subject. Out of them only a rare few who can discover in themselves the necessary mental stamina, the intellectual vision and physical forbearance to lead that life of truth and purity in the world and remain in perfect peace and tranquility.

## PSYCHOSOMATIC PERSONALITIES

सत्त्वं रजस्तम इति गुणाः प्रकृतिसंभवाः ।
निबध्नन्ति महाबाहो देहे देहिनमव्ययम् ॥

(Gita, 14 : 5)

There are three qualities of mind namely Satwa (Pure), Rajas (Passion) and Tamas (Darkness) the qualities of which each man inherits at the time of his birth. These are the three types of influences on the psychosomatic constitution, and each man's behaviour is dependent upon the amount of each Guna exists in his body constitutions which he inherits from his parents.

तत्र सत्त्वं निर्मलत्वात्प्रकाशकमनामयम् ।
सुखसङ्गेन बध्नाति ज्ञानसङ्गेन चानघ ॥

(Gita, 14 : 6)

Because Satwa is pure it causes a pure healthy and shining personality in a person who possesses it. It also enhances the happiness and knowledge in each person who has predominance of Satwa in his psychosomatic constitution. It is stated that when the mind becomes purified the personality also becomes purified which causes inward peace and happiness. Since the psychosomatic constitution varies from person to person, the capacity to intelligently perceive the world differs from person to person. Thus if the mind is clear and the intellect steady, a more efficient intelligence is manifest; similarly Satwa also binds the mind to the body for attaining knowledge and happiness. But once we become attached to thrilling joys of creative thinking and the inspiring life of wisdom, we sacrifice everything thereafter in order to live upto the standard consistantly followed throughout our life.

रजोरागात्मकं विद्धि तृष्णासङ्गसमुद्भवम् ।
तन्निबध्नाति कौन्तेय कर्मसङ्गेन देहिनम् ॥

(Gita, 14 : 7)

The quality of Rajo Guna consists passion for something originated from thirst and attachment. It also binds one for the result of any action. When we are in a mental state of predominance of Rajo Guna we become full of painful passions in our mind for many desirable and attachments are main root cause of all our miseries and are due to the influence of Rajo Guna within us at that particular moment.

तमस्त्वज्ञानजं विद्धि मोहनं सर्वदेहिनाम् ।
प्रमादालस्यनिद्राभिस्तन्निबध्नाति भारत ॥

(Gita, 14 : 8)

"The Tamo Guna is born out of our ignorance and caused by deception of all the people. It binds the mind to the body with madness, laziness and sleep."

In this state of mind influenced by Tamo Guna man's intellectual capacities to descriminate between the right and wrong thing becomes clouded. The status of our personality becomes lower than normal causing endless misconceptions and misunderstandings. There occurs no consistancy of purpose, brilliance of thought or nobility of action in the individuals who come under the influence of Tamo Guna.

In short, Satwa Guna makes us attached to the inward happiness arising out of the thrill of creative performance of our life. In Rajo Guna we carry on the endless activities with great desire to achieve success and with deep attachment to fulfil our ambitions. With Tamoguna, we fail to arrive at a right judgement leading to indiscriminations and wrong actions.

Thus the quality of our thought at any given moment is influenced by the type of

Guna that has come to play in our inner life. Therefore one should realise that our overall performance of life depends upon predominance of one Guna within us and cultivated by each one of us throughout our life.

सत्त्वात्संजायते ज्ञानं रजसो लोभ एव च ।
प्रमादमोहौ तमसो भवतोऽज्ञानमेव च ॥
(Gita, 14 : 17)

"From Satwa Guna arises knowledge, from Rajas arises greed and from Tama mental imbalance, confusion and ignorance occurs."

Thus from Satwa Guna one usually gets knowledge and wisdom. With Rajo Guna one usually gets a constant eruption of desires leading to a state of agitation. But when one is filled with Tamo Guna, he miscalculates the world, and expects too much and then curses the world for its imperfection. Such misunderstandings and misconceptions caused by Tamo Guna are the root cause of all the misfortunes in one's life. The following are some of the qualities of the persons who have surpassed and conqueured all these three senses.

समदुःखसुखः स्वस्थः समलोष्टाश्मकाञ्चनः ।
तुल्यप्रियाप्रियोधीरस्तुल्यनिन्दात्म संस्तुतिः ॥
(Gita, 14 : 24)

"He is a man of perfection, who treats alike both pleasure and pain, who is otherwise healthy, to whom a piece of earth, precious stone and gold are the same, to whom good and bad things are alike, the one who is firm, and he who treats alike both abuses and praises."

In this stanza, the main thing that is brought out is the equanimity of life under all provocative circumstances. The man of steady wisdom is one whose equilibrium is not lost at any adverse circumstances of the world around him. The ordinary man gets himself entangled into the life of agitation and sorrows, the moment he faces pleasures of pains, good and bad possessions, agreeable and disagreeable experiences. joys and sorrows provided by praises and censures. But a man of perfection faces all these situations badly and maintains equanimity to the best of his abilities.

मानापमानयोस्तुल्यस्तुल्यो मित्रारिपक्षयोः ।
सर्वारम्भपरित्यागी गुणातीतः स उच्चते ॥
(Gita, 14 : 25)

"A person who behaves in the same way both at the time of receiving honour or dishonour, with friends or enemies, and he who has renunciated the fruits of all his actions is considered to have excelled the three Gunas mentioned earlier."

Here development of sense of equanimity in honour and dishonour is a definite sign of perfection attained. Similarly he who follows the path of perfect wisdom and has crossed the level of Gunas, has neither any enemy nor friend. Further he carries all his activities without any motivation of getting name, or fame. These are some of the essential signs that shows the one who has risen above all the Gunas.

## SOME SPECIAL CHARACTERS OF MEN

Continuing with classification of psychosomatic constitution, the human beings can also be divided into two, the person with good qualities and the bad, depending upon their behaviour.

अभयं सत्त्वसंशुद्धिर्ज्ञानयोगव्यवस्थितिः ।
दानं दमश्च यज्ञश्च स्वाध्यायस्तप आर्जवम् ॥
(Gita, 16 : 1)

The qualities of the persons which are considered good are fearlessness, purity of heart, steadfastness in knowledge believer in Yoga. Further he is charitable, has good control over sense organs, prepared to sacrifice on any occasion, he who continuously studies the literature, who follows austerity in life and who is very straight forward is considered as a person with good quality.

अहिंसा सत्यमक्रोधस्त्यागः शांतिरपैशुनम् ।
दया भूतेष्वलोलुप्त्वं मार्दवं ह्रीरचापलम् ॥
(Gita, 16 : 2)

Harmlessness to others, truth, absence of anger. renuncitatlon, peacefullness, absence of crookedness compassionate to all beings, non greedy, gentleness modesty, and absence of unsteadyness. These are some of the additional good qualities of the persons living in this world and therefore one should try his utmost to acquire all these good qualities in him to attain the full perfection.

तेजः क्षमा धृतिः शौचमद्रोहो नातिमानिता ।
भवन्ति संपदं दैवीमभिजातस्य भारत ॥
(Gita, 16 : 3)

Further, utmost vigour, forgiveness, firmness, purity, absence of hatred, absence of pride—all these qualities are divine in origin and hence one should try to acquire them as best as he can.

On the other hand the following are some of the bad qualities of a person, the acquisition of which will certainly put us down both physically and morally in this world.

दम्भो दर्पोऽभिमानश्च क्रोधः पारुष्यमेव च ।
अज्ञानं चाभिजातस्य पार्थ संपदमासुरीम् ॥
(Gita, 16 : 4)

"Too much of pride, arrogance, self conceit, and also harshness to others and ignorance" these are some of the bad qualities of life. Amongst the various other descriptions of bad qualities the following are the most important ones.

आशापाशशतैर्बंद्धाः कामक्रोधपरायणाः ।
ईहन्ते कामभोगार्थमन्यायेनार्थं सञ्चयान् ॥
(Gita, 16 : 12)

He who has bound himself by hundred ropes of hopes and desires and he who has become the victim of lust and anger, and he who tries to obtain wealth by means of hoarding for getting sensual enjoyment is considered as a thoroughly bad character. These persons with such bad qualities are very often seen in the present day world and one should constantly advise them to correct themselves quickly failing which they should be completely avoided and bycotted to avoid further deterioration in the moral values of the society.

How can one mould his mind from lower to the higher status is the question for which following methods have been described,

देवद्विजगुरुप्राज्ञपूजनं शौचमार्जवम् ।
ब्रह्मचर्यमहिंसा च शारीरं तप उच्यते ॥
(Gita, 17 : 14)

"By worshiping Gods, Brahmins, Teachers and the Wisemen, by strictly observing purity. straight forwardness, celibacy and non-violence one can create a sense of austerity in our life which will enable us to follow the higher path,"

Here we should remember that all cultural developments, moral and ethical growths can be accomplished within ourselves only through these processes of devotion and reverence to the God, Teachers and other respected persons. Here Ahimsa or non-injury indicates not only avoiding physical injuries to others, but also avoiding all acts of injuring others from the emotional and intellectual level also.

In short self control, conservation of energy and redirecting the same to more profitable creative and intellectual activities is called "Tapas" of the body.

अनुद्वेगकरं वाक्यं सत्यं प्रियहितं च यत् ।
स्वाध्यायाभ्यसनं चैब वाङ्मयं तप उच्यते ॥
(Gita, 17 : 15)

"The tapas or restrain in speech is that which causes no excitement, it should be truthful, pleasant and beneficial, and also it is based only on ones own studies of literature."

Here we should realise that speech is a powerful vehicle in man and it reflects the actual intellectual calibre, mental descipline, and physical self control of the speaker.

Therefore unless he is well informed at all these levels, his speech will have no meaning at all. At the same time it can also be a means through which the greatest amount of our energy can be wasted. Therefore, we have to control and conserve the unproductive waste of energy by restraining our speech to the best of our abilities, Further when one speaks he should always speak the truth; it should be agreeable and beneficial to others and himself. This also indicates that when a truth is disagreeable to others he is required to maintain a discrete silence. These are some of the austerity measures in the field of speech.

मनः प्रसादः सौम्यत्वं मौनमात्मविनिग्रहः ।
भावसंशुद्धिरित्येतत्तपो मानसमुच्यते ॥
(Gita, 17 : 16)

"The pleasant temperament, the calmness, silence, self control, the purity of inner feelings are some of the austerities of the mind."

The pleasant temperament and calmness of mind comes to us only when our relationship with the world outside are put on a sound basis. Similarly the warm feeling of affection to all is called kindness. Hence we should always practice self control with pure motive of achieving the highest goal in a truthful manner. These are some of the austeries of mind which should be strictly followed by every one.

## YOGIC PRINCIPLES OF LIFE

As already discussed earlier, yoga demands some type of restraint and austerity in every walk of our life. At the same time one should not get away with the idea that the beneficial effects of yoga can be obtained onlyby 'Sadhus' or 'Sanyasis' who have completely renounced the comforts of modern world. Nor its benefits can be acquired by members of the present day ultra modern and the so called civilised community who do not want to observe the minimum basic requirements the yoga has prescribed for its followers. The truth of the fact is that it can be acquired by any common man who is deeply interested in the subject and who wants to lead a happy life physically and mentally.

There is no short cut and every one who is interested in yogic practice will have to struggle hard ceaselessly as per the standard technique to acquire the physical, mental and intellectual strength. Along with these qualities if one can acquire and follow the spiritual and philosophical principles it would give an added benefit. It is this fact some times people do not attach much importance due to which the life of such followers remain incomplete and imperfect. Therefore spiritual and philosophical part of yogic life should be given equal importance as is being given now for the physical and psychic aspects. If one follows these principles and had a life congenial to himself and the society, he will become an ideal person to be imitated by others in the society. Therefore some of the philosophical aspects of yogic life are briefly given here, mainly based on the exhortations made in Bhagavad Gita.

देहिनोऽस्मिन्यथा देहे कौमारं यौवनं जरा ।
तथा देहान्तरप्राप्तिर्धीरस्तत्र न मुह्यति ॥
(Gita, 2 : 13)

"Just as in this body, the life passes from childhood to youth and then to old age, so also same life passes into another body. Therefore the wise man does not repent on this."

This stanza says that one should never be perturbed over the death of a person just as we do not mean at the end of the childhood following which alone youthful experience comes. Thus youthfulness may be considered as a birth when the childhood has met with its end or death. So also the old age is born when youthfulness is dead. And yet none of us feel least disturbed over these changes.

Thus applying the principles of memory, we can say that something is present in us common in all the different stages of our growth so that it can remember its own experiences gained in the past through the body of childhood, youthful stage and old age. In the same way at the time of death (by following the reincarnation theory) there is no extinction of the individual, but his life or soul leaves its previous bodily structure at the time of death and enters into the new one where it expresses itself completely just as it had done in the earlier body, Therefore death should be taken as another stage of development of a person and hence the wise man with the above knowledge of life should never mourn on the physical death of a person. This is an important statement of Indian Culture in which people have strong faith in reincarnation of the life and for which there are several other evidences to prove it.

वासांसि जीर्णानि यथा विहाय
नवानि गृह्णाति नरोऽपराणि।
तथा शरीराणि विहाय जीर्णा-
न्यन्यानि संयाति नवानि देही॥

(Gita, 2 : 22)

Just as a man discards his old worn out clothes and puts on new ones, in the same way the soul of the person casts off its worn out body and enters the new ones,

This is one of the important stanza which says how a soul leave the body of an individual after it has been used up by its prolonged existence and then adopts the new ones to suit its convenience and work. There is nothing peculiar in this change and the entire world adopts this technique as a normal course of life. According to this view, the same soul of life changes the physical body from one to other after the earlier one is thought to be completely worn out and the one to be entered is a completely new one.

Thus it should be clearly realised that death causes grief for only those who have no understanding. For those who understand the implications of death, it does not produce any adverse reaction in mind. Just as changing of the dress does not cause any pain to the body, in the same way the dweller of the body leaves it to adopt the new one causes no pain. In short, this stanza clearly indicates again the Doctrine of reincarnation which is one of the most important contribution of Indian Philosophy to the world.

संन्यासस्तु महाबाहो दुःखमाप्तुमयोगतः।
योगयुक्तो मुनिर्ब्रह्म नचिरेणाधिगच्छति॥

(Gita, 5 : 6)

It is difficult to attain renunciation without Yoga. However that person who has harmonised yoga with study contemplation quickly attains the goal.

योगयुक्तो विशुद्धात्मा विजितात्मा जितेन्द्रियः।
सर्वभूतात्मभूतात्मा कुर्वन्नपि न लिप्यते॥

(Gita, 5 : 7)

He who is devoted to the path of action, whose mind is quite pure, who has conquered the self, who has subdued his senses and who realises his self as the self in all beings, does not become attached to it.

This stanza tells us that person who is well versed in yogic activities in its real sense gets purification of his mind and intellect. Such a purification of the body, mind and intellect will certainly give rise to inner peace. In fact the lesser the agitations caused by excessive desires and emotions, the more we are likely to become pure. When through the practice of yoga the man has gained an inner peace both at mental and his intellectual levels it becomes easy for him to restrain and control his sense organs and thus ending appetites. A seeker who has thus controlled himself on all these three different layers in him namely his body, mind and intellect becomes the best fitted person for the highest meditation.

अनाश्रितः कर्मफलं कार्यं कर्म करोति यः ।
स सन्यासी च योगी च न निरग्निर्न चाक्रियः ॥

(Gita, 6 : 1)

He who performs his duties without depending upon the fruits of action is a Sanyasi and a Yogi. He is not a Sanyasi who does not perform any action or he has no urgue to do so.

उद्धरेदात्मनात्मानं नात्मानमवसादयेत् ।
आत्मैव ह्यात्मनो बन्धुरात्मैवरिपुरात्मनः ॥

(Gita, 6 : 5)

"A man should lift himself by his own efforts and he should never try to lower himself in any manner; because one should always remember that the man himself is his own friend and he himself is his own enemy."

Here, it is clearly stated that if a man wants to raise himself above the ordinary level of humanity in general, he has to raise himself considerably to achieve the greater perfection at the cultural and spiritual level. We always have an ideal before us, but many a times this ideal remains in the realism of thought only and not in the world of our action.

In order to raise ourselves from the lower level to the higher, no teacher can help us much and no writings of others would educate us more. The lower status of our mind must be trained by us slowly and steadily to come up under the influence of the discipline of the higher. In this process, many might help us, but the actual achievement will depend upon how far we ourselves learn to lift ourselves from the lower status to higher. Hence it is entirely dependent on us to raise up to the occasion and clinch every opportunity in our life to raise ourselves from the ordinary level of man."

Further it is not only sufficient that we look within and come to realise our weaknesses and correct them with good qualities, but also to see that all these good qualities are retained in us and do not fall back to its original low levels. Therefore, we should always remember that we are our own friends provided we serve ourselves to raise to the highest level. Failing this, we will be considered as our own enemy; because we have not utilised the great opportunities given to us for the betterment of our life and we lost the chance for ever for improving ourselves by our own efforts. This I think is one of the most practical suggestion given by Gita for betterment of ourself by our own efforts and it should always be remembered in our every day life.

जितात्मनः प्रशान्तस्य परमात्मा समाहितः ।
शीतोष्णसुखदुःखेषु तथा मानापमानयोः ॥

(Gita, 6 : 7)

"He should be considered as the noble person who has fully controlled himself well and who is peaceful and also that who is well balanced in cold and heat, pleasure and pain and in honour and dishonour."

A noble person with supreme object should constantly realise that one who is perfectly self controlled and serene, unruffled in all circumstances favourable or unfavourable, in all environments good or bad, in all companies wise or foolish, can only overcome his obstacles to achieve the highest goal of his life. Similarly one should not be upset with the extreme heat or cold that is felt at the bodily level. Nor he should change his mental attitude, when he experiences a pleasure or pain, hatred on love, affection or jealousy, kindness or cruelty and similar other mental storms within. Similarly he should not loose his balance by getting honour or dishonour which is commonly felt at the intellectual level. When one overcomes all these obstacles of the levels of body, mind and intellect he should be considered as the really noble person with highest perfection in life.

आत्मौपम्येन सर्वत्र समं पश्यति योऽर्जुन ।
सुखं वा यदि वा दुःखं स योगी परमो मतः ॥
(Gita, 6 : 32)

"A person who sees all persons are similar to himself and sees equality everywhere be it be pleasure or pain or he is regarded as the highest Yogi."

The true meditators with perfect equanimity in their intellectual understanding and spiritual experience recognise the divine presence in every one of them. Thus according to Gita the highest Yogi is the one who feels the pains and pleasures of others as intimately as if they were his own. The well known saying "Do unto others as you would be done by others" is based on the some principle as is described in this stanza. The famous saying of Bible "Love thy Neigebour as thyself" also conveys the same meaning. Thus such an individual who has realised by his constant Yogic practice that the entire universe is like his own form and who contributes selflessly and work to the welfare of the society more than to himself is considered as the highest Yogi.

## CERTAIN PRESCRIBED CONDUCTS OF LIFE FOR ATTAINING PERFECTION

They are as follows :

अद्वेष्टा सर्वभूतानां मैत्रः करुण एव च ।
निर्ममो निरहंकारः समदुःखसुखः क्षमी ॥
(Gita, 12 : 13)

He who does not hate any person or creature; who is friendly and compassionate to all, who is free from attachments and egoism, who is well balanced in pleasure and pain and who is also capable of restraining himself well, is considered as a well balanced man.

सन्तुष्टः सततं योगी यतात्मा दृढनिश्चयः ।
मय्यर्पितमनोबुद्धिर्योमद्भक्तः स मे प्रियः ॥
(Gita, 12 : 14)

"Similarly he who is always found contented, steady in meditation, self controlled, possessed of firm conviction, with mind and intellect fully dedicated to me will be the devoted very dear to me" (will be admired by all). These are some of the most important and characteristic features of man of perfection. He also thus prescribes the correct code of conduct to those who want to attain the goal of self perfection. Thus Chinmayanand summarises these two stanzas as follows :

"His attitude to all living creatures would be friendly and he is ever compassionate to all. He offers security of life to all beings. Even minded in pain and pleasure, he remains supremely unaffected even when beaten or abused. Always content, he discovers a flawless infinite joy in himself, whether he obtains or not even the means of bodily subsistence. Steadfast in his meditation, self controlled and firm in resolve, he lives on joyously. Such a perfect person of wisdom is Dear to me." These are some of the important characteristics of man of perfection. Further—

यस्मान्नोद्विजते लोको लोकान्नोद्विजते च यः ।
हर्षामर्षभयोद्वेगैर्मुक्तो यः स च मे प्रियः ॥
(Gita, 12 : 15)

"He from whom the world is not fed up and he who cannot be agitated by the world, He who is free from joy, envey, fear and anxiety, is dear to me." A man of perfection is one who will not create any agitations in the world around him. Further, when even those who are agitated in the world approach such a man of perfection, loose all of their agitations and come to enjoy peace in themselves.

Similarly such a man of perfection cannot be lead into the state of agitation however the world around him is revengeful, boistrous and revolting may be. Such a man of steady state of balance will always remain like a Rock in any adverse situation around him.

अनपेक्षः शुचिर्दक्षः उदासिनोगतव्यथः ।
सर्वारम्भपरित्यागी यो मद्भक्तः स मे प्रियः ॥
(Gita, 12 : 16)

"He who is free from wants, pure, prompt unconcerned and untroubled, renouncing the results of all his efforts and he who is entirely devoted to me is dear to me."

It is well known that the cleanliness of a man's own dress and outlook can give us a great insight into mental nature, discipline and culture of that man. Thus without an external purity internal purification is not possible.

Similarly the promptness and alertness is another important feature for any enthusiastic person to achieve his goal quickly. Further he should overcome all those pinpricks of life to get over these minor impediments–

यो न हृष्यति न द्वेष्टि न शोचति न काङ्क्षति ।
शुभाशुभपरित्यागी भक्तिमान्यः स मे प्रियः ॥
(Gita, 12 : 17)

"He who neither rejoins nor hates, neither grieves nor desires, He who renounces all the good and bad things, and who is a perfect devotee, is dear to me." A perfect man is one who has lifted up himself always from the usual worldly life and has awakened his inner spiritual nature. Therefore ordinary experience of joy and sorrow, pain and pleasure, which usually give restlessness in ordinary life will not effect him with a perfect equanimity.

समः शत्रौ च मित्रे च तथा मानापमानयोः ।
शीतोष्णसुखदुःखेषु समः सङ्गविवर्जितः ॥
(Gita, 12 : 18)

He who has the same sense of feelings towards his friends and enemies, towards honour and dishonour, who will be the same towards cold and heat, pleasure and pain and who is free from all the attachments will be most dear to me.

तुल्यनिंदास्तुतिर्मौनी सन्तुष्टो येन केन चित् ।
अनिकेतः स्थिरमतिर्भक्तिमान्मे प्रियो नरः ॥
(Gita, 12 : 19)

To whom abuse and praise are equal, who is silent, and who is satisfied with each and everything that is given, who is homeless, steady minded with full of devotion, will be the man who is dear to me.

Such a person who maintains equanimity when he meets both his friends and enemies is a the person of great perfection. Similarly he maintains great mental equanimity when he gets honour or when he faces dishonour. Similarly worldly censure or praise should not change the mental attitude of a perfect man. Because one should always realise that one who has been praised today will be condemned by the society tomorrow and the last years condemned man may become the praise-worthy person of today. Praise and condemnation express in themselves nothing more than the passing phase of those who are doing. Hence no one should be perturbed over them and certainly not by the person striving hard to become the perfect man. These are some of the most important qualities to be acquired by all the persons who are desirous of reaching the higher goal of life. Unless one tries to practice and live with these qualities in his everyday life he can never think of achieving the highest status of life. Hence each one of us should make all out attempts to win our body, sense organs, mind and intellect and acquire all these qualities to the best of our abilities. Then only we can hope of achieving the goal within our life time.

## CHAPTER V

# CONCLUDING REMARKS

As we have already discussed Yoga is an age old branch of Indian Science and Philosophy. Till the recent past, it mostly remained the domain of a few expert spiritual leaders like Sadhus and Sanyasis living in Himalayas and other secluded places. However, towards the later part of 19th Century and early 20th Century, several Indian scholars took up this subject for their specil studies and contributed greatly for propagating the utility of this science for the good of common man. Amongst them, Swami Vivekenanda and Sri Aurobindo were the two most illustrious scholars who have done a great pioneering service in this field. In addition there are scores of others who widely propagated this Science not only in India, but also in the whole world.

However, during this periods, medical science was too much preoccupied with the control of devastating infectious diseases throughout the world. especially in those areas where industrialisation and urbanisation lead to overcowding and insanitary conditions in the cities. Now, thanks to the advancement of medical sciences especially in the field of microbiology, immunology and preventive medicine, the incidences of most of these infectious diseases have decreased very fast throughout the world, especially in the well developed Westen countries. In fact, it is gratifying that a number of infectious diseases such as small-pox, cholera, typhoid, etc. have completely disappeared from many of the advanced countries.

Here, one should realise that as the infectious diseases have declined, the incidences of psychosomatic stress disorders have markedly increased in recent years. Thus the incidences of hypertension, coronary insufficiency, diabetes mellitus, chronic peptic ulcer, asthma, thyrotoxicosis, ulcerative colitis, etc. have greately increased in most of the developed countries. Here, if one adds cancer as a stress disorder, which fact is now seriously debated at many places, the incidence of stress disorders has increased tremendously in recent years.

Because of the fact that psychosomatic stress is primarily a mental phenomenon, mere medical or surgical management does not give a full protection to these patients. It was recently observed all over the world that in in such psychosomatic situations, different types of yogic practices either singly or jontly can give a great benefit to the needy patients. As the incidences of psychosomatic disorders are increasing at an alarming rate especially in the well advanced countries, and as there is no satisfactory method to overcome these problems in the modern medical sciences, it is felt by many well known workers that there is an urgent need for conducting a detailed scientific studies to assess the exact value of various yogic procedures in combating different stress disorders. It is because of this urgency that we undertook this study in our laboratory and the present monograph is mostly the result of conducting such studies.

When we talk about yoga, it gives different meanings to different people. For some, it is only Hatha Yoga or physical exercise, whereas for others it is only the meditation. However, we feel that it is the integrated practice of 8 methods of yoga as described by Patanjali is the correct interpretation and meaning of the word yoga, we further feel that in addition to Patanjali's method, one must also be fully conversant with the philosophical basis of yoga since one will have to mould his approach to all his life problems in a balanced and tactful manner. For this, amongst all the texts, the Bhagawad Gita is the most important treatise which gives answers to most of the problems of life in some way or the other. Here in this book, apart from giving philosophical answers to many of the problems of daily life, we have highlighted the three methods of yoga namely Karma Yoga, Bhakti Yoga and Jnana Yoga. Thus if one can accept the Patanjali's essentials of 8 methods of yogic practice to be freely intermingled with the various Philosophical exhortations of the Bhagawad-Gita, then he can really live a happy and healthy life throughout the period. Hence, we have made a free use of all these observations in our study.

It is a fact in the last quarter of 20th Century, people all over the world have become so much fascinated by the marvellous achievements of modern sciences that they are somewhat hesitant to accept anything meant for improving the standard of their life unless it had stood the test of science. Yoga is no exception to this. Hence there was an urgent need for conducting scientific studies and we are happy that we could make an earnest beginning and could lay a foundation for scientific studies on Yoga.

Thus in this introductory volume, we have mostly given the methods we have adopted in studying the scientific aspects of yoga and the results that we could obtain in comparison to other studies. Similarly, we also used these methods for treating some of the most common stress disorders such as hypertension, thyrotoxicosis, asthma, rheumatism with gratifying results.

In this study we submitted the normal volunteers to some of the common Hatha Yoga practices or physical postures for six months. Then we found a significant fall in pulse rate, blood pressure, respiration rate, and also the body weight. Similarly serum cholesterol and blood sugar also showed some reduction. However, the serum protein level increased after these yogic practices. Similarly one could observe improvement in the neuropsychological function of these persons after 6 months of yogic practice. Similarly there was a fall of neurohumors such as acetylcholines and catecholamines. From all these findings one can say that Hatha Yoga produces much improvements in the neuro-endocrinological functions of the body. The pranayama also produces almost similar results as in the Hatha Yoga practices.

The vipasana type of meditation Experiments when conducted in an intensive manner on people for 10 days, the neurohumors were found increased in all the people and increased alpha-activitiy in E.E.G. (Fig. 36 & 37). However, when we submitted the people on all the three types of yogic practices such as Hatha Yoga, pranayama and meditation (relaxation type), all the neurohumors became less and the persons remained very much alert and active. Hence our scientific studies on these yogic practices indicated that one will have to practice an integrated type of Yoga which mainly consists of asana, pranayama and meditation if he wants to derive full benefit from these yogic practices.

However, these are only the basic approach to the practice of yoga. If one wants to study and practice a complete spectrum of yoga he has not only to practise yoga described above,

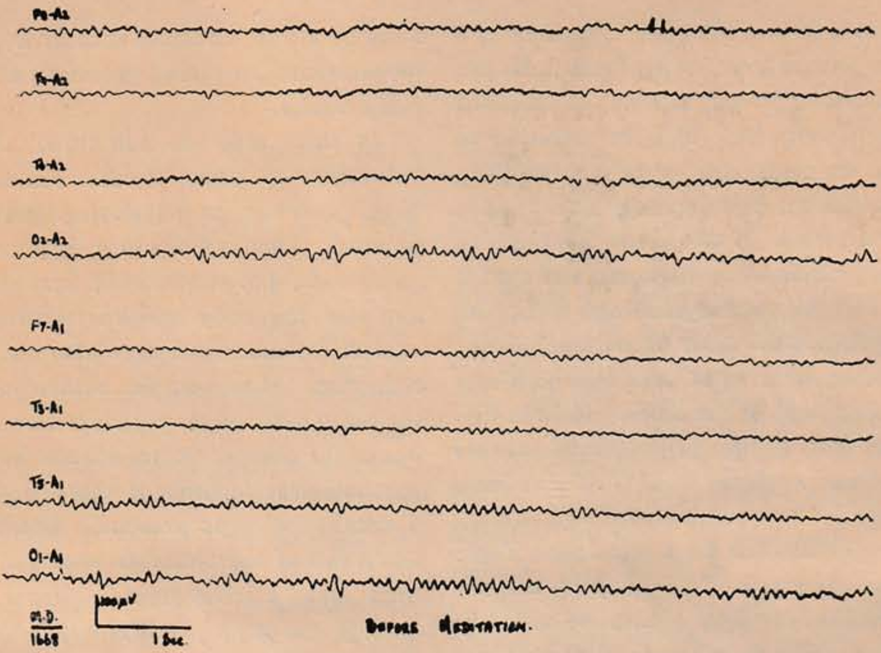


Fig. 36 : Normal E. E. G. Pattern before meditation. Please compare it with Fig. 37 recorded during meditation.

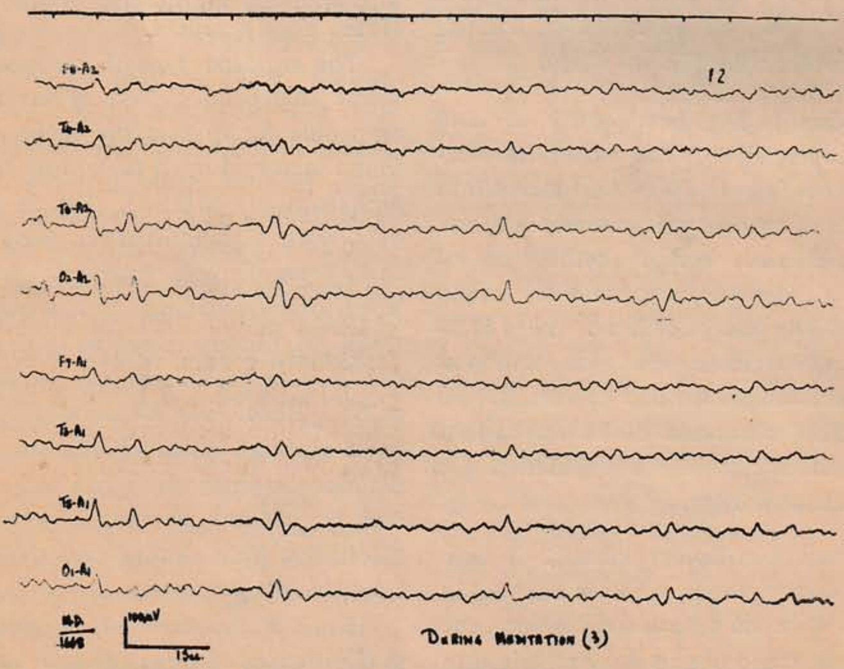


Fig. 37 : E. E. G. Pattern during meditation showing a number of well formed alpha activity indicating tranquility of mind during the process

but also to study different aspects of yoga philosophy in detail especially the Bhagawad Gita so that he can formulate certain attitude of life which would make him beneficial to all mankind. Unless one is able to calm his mind by a constant practice and by renunciation, one cannot reap the full benefit of the vast science of yoga. It is indeed a treasure-house of peace and tranquility and hence every one of us living in the modern society should make full use of it with the view to serve the humanity at large. It is only with this intention that this introductory monograph has been compiled and it is hoped that people will make a full use of this human science through this monograph.

## ACKNOWLEDGEMENT

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I am really thankful to the Editors the of the Journal of Research in Indian Medicine for kindly consenting to publish this Monograph in their Journal and hope their readers will be fully benefitted by the new approach to study of this Science of Yoga.

*K. N. UDUPA.*

## APPENDIX

## 110 YEARS OF YOUTH THROUGH YOGA*

"YOGA in many ways is the POWER OF THOUGHT. This "Thought Power" is directed by CONCENTRATION, and it naturally follows that before you can intelligently direct THOUGHT POWER you must learn HOW TO CONCENTRATE.

The best time for concentration is first thing in the mornig and last thing at night. Spend at least 15 minutes, twice a day, and make it a regular practice.

Please do not do it only when you feel like it and miss two or three days at a time, and think you can make up for lost time by doing double one day and a little the next. You must be persistant and consistent. You will find the continued effort will produce the quickest and best results. The more perfect you become at concentrating the sooner the definite results begin to manifest themselves, and once you find you are getting results, no matter how slight they may be at the beginning then you will find yourself makig rapid progress. You will have proved to your own satisfaction that you now have the knowledge ane power to control, and this will enable you to make your hopes, aims and ambitions become realities."

"I have no doubt many people when they read that I am 110 years old, will conjure up in their mind's eye a wizened old man either being wheeled about in a bath chair, or bedridden, depenent upon any kind soul to help me about.

Let me at once put you right on these points. I certainly am not decrepit and helpless and can boast I am quite a long way from any such deplorable condition. I am still very active; my brain still has the quality of being able to function quite normally; my general health is excellent. I admit my eyes trouble me slightly, but with the aid of glasses which I only started wearing recently, I can still do my own writing and get them unaided. I still enjoy my food and I am not a total abstainer.

My memory can take me back to the time when I was five years old. I have seen many changes during more than century of the march of time, and during my calling as a journalist I have managed to meet many great people and seen unique sights in many parts of the world. My earliest vivid memory take me back to the burning of the Houses of Parliament in London, also the accession of queen Victoria to the throne. I have conversed with the great Charles Dickens, and the equally great Disraeli. I can remember the distressing illness of the prince of Wales (afterwards king Edward VII) and the great rejoicing of the populace of London when he recovered. There are hundreds of other incidents in my life which to the ordinary person may seem outstanding, but to myself just seem like simple events. But the episode in my life which I can never forget is the one that was the means of my introduction to YOGA.

I will give you briefly the outline of the remarkable manner in which I made the acquaintance of the venerable teacher of the yoga philosophy, and to which meeting I attribute my longevity.

---

* BY CHARLES HENRY ARNOLD.

It happened in India when I was making a visit to the Holy City of Banaras in the year 1852, during a time when the natives were pouring into the town in their thousands to celebrate one of the annual feasts. I happened to be in the vicinity of a skirmish between some Hindus and Moslems, and, seeing a mob beating a poor old man unmercifully, I interfered. As I was a white man my commands were obeyed and they left him alone, but not before he had suffered severely and was nearly dying. I got him removed from the crowd and helped to wash and bind some of his cuts and wounds.

This old man happened to be great 'Guru' (the highest grade of Yogi), whose name was Swami Chakrannanda.

In return for being instrumental in saving this man's life he offered me what he considered to be the greatest blessing one mortal can bestow upon another the philosophy of YOGA. He became my teacher, and at that time he was ONE HUNDRED AND FORTYSEVEN YEARS OLD. You can now understand why I say I date my real life from the day I came in contact with that wonderful master of the Yoga Cult."

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*Short Research Communication*

# MICROBIOLOGICAL ASPECTS OF SOME INDIAN MEDICINAL PLANTS

Chemical investigation of two important medicinal plants lead to the isolation of four saponins *Viz* saponins A, B, C, D, from *Costus speciosus*, (Dasgupta *et al*, 1970; Pandey *et al*, 1970) and rubrafusarin & emodin from *Cassia tora*. The latter two compounds of *Cassia tora* are already on record (Rangaswami, 1963; Poethki *et al*, 1968). The present note gives an account of a mild antifungal activity of the isolated principles in *in-vitro*.

Saponin A; m.p, 289–290°C is β–sitosterol 3, 0–glucoside where–as saponins B, C, and D (m.ps 305–307°C, 232–233°C and 301°C respectively) each on acid hydrolysis yield diosgenin (m.p 198–202°C), glucose and rhamnose. It has however been established that saponine B, C, and D have identicle aglycone as diosgenin but differ from each other only in their content of the relative proportion of glucose and rhamnose, the former always predominating. Emodin (m.p 186–187°C) is a phenolic anthraquinone derivative whereas rubrafusarin (m.p 207–208°C) is a phenolic naptha–pyrone derivative.

The compounds were dissolved in ethanol and incorporated in modified Czepek's medium to obtain different concentrations. Their antifungal activity was seen both against the plant fungi such as *Aspergillus flavus, Fusarium vasiinfectum* and *Rhizopus nigricans* and the animal fungi *viz Epidermophyton floccosum* and *Microsporum gypseum*.

Fungi invariably showed the growth in the untreated medium (serving as blank) after two days at 24°C. However, it was observed that although pure β–sitosterol and diosgenin had no antifungal activity in concentrations upto 500 µg/ml, saponin A delayed the growth of *Rhizopus* and *Aspergillus* by one day in the same concentration. Further saponins B, C and D induced a general inhibition of growth on plant fungi by two days and three days in concentrations of 250 µg/ml and 500 µg/ml respectively whereas practically no effect on the animal fungi was observed. Emodin and rubrafusarin however did not show any appraciable effect on the fungi.

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*Short Research Communication*

# SOME PHARMACOLOGICAL STUDIES ON *PEDALIUM MUREX* LINN

The alcoholic extract of fruits of *Pedalium murex* produced fall in blood pressure in dogs and rats which was blocked by Atropine sulphate. It has increased the intestinal motility in dogs but did not show any effect on respiration. Spasmogenic effect was found on guinea-pig ileum and rabbit intestine which was blocked by Atropine sulphate and Mepyramine maleate. Repeated doses produced tachyphylaxis, however, there was no effect on frog rectus abdominus and frog's heart.

*Pedalium murex* (Family Pedileacae) commonly known as "Bara Chokru" grows abundently on the sea-coast of Southern India and Ceylon. In Indian medicine, the plant is said to be useful as diuretic, antiseptic, used in impotency and in incontinence of urine (Chopra, 1958). It has also been used as an emmenagogue and ecbolic (Kapur, 1948). The present communication reports some of the pharmacological actions of the alcoholic extract of fruits of this plant as no pharmacological studies have been done so far.

The fruits of *Pedalium murex* linn were dried at room temperature and extracted with 95% alcohol by cold maceration process as described in British Pharmacopea (British Pharmacopoea 1963). The solvent was distilled and the residue was dried at room temperature and suspended in Gum Acacia. The effect of this emulsion was studied on the following intact and isolated preparations. Dog and rat blood pressure and respiration (Mcleod, 1970), dog intestinal motility, frog heart perfusion (Burn, 1952), isolated guinea pig ileum and rabbit intestine. It was also studied on frog rectus abdominus.

When injected intravenously (femoral vein) in doses of 250 ug/kg in dogs and rats, the extract caused a considerable fall in blood pressure to the extent of 30-35 mm of Hg. This effect on blood pressure was blocked by Atropine sulphate (1 mg/kg) and Mepyramine maleate (10 mg/kg). Tachyphylaxis was observed on repeated administration, however, the extract did not produce any change in rate and depth of respiration in both the species. The tone and amplitude of contraction of the intestinal musculature was increased by the extract in dogs.

The extract caused contraction of the smooth muscle of guinea-pig ileum and increased the spontaneous movements (Pendular) of the rabbit's intestine. On these isolated preparations the extract caused a contraction in a dose of 1 mg of bath volume similar to the contraction obtained with 1 μg of acetylcholine and histamine. The extract also potentiated the contractile responses of acetylcholine, histamine and barium chlorido on guinea-pig ileum and rabbit intestine.

The response of guinea pig ileum and rabbit intestine to the extract was blocked by

Atropine sulphate and mepyramine maleate when added in the isolated organ bath 1, µg/ml, 5, µg/ml respectively of bath volume.

The extract did not produce contraction of isolated frog rectus abdominus muscle nor it modified the responses of acetylcholine even at a dose of 8 mg of bath volume. No effect was observed on rate and amplitnde of perfused frog heart upto doses of 150 µg but on increasing the doses to 1 mg, an increase in amplitude but no change in heart rate was observed.

The spasmodic action of the extract is blocked by atropine sulphate on both isolated and intact preparations, the extract was found to be inactive on the frog rectus abdominus muscle. It is suggested that the extract exerts its action on the muscarinic but not on the nicotinic receptors. The specific blockade of its action by the mepyramine maleate suggests that it has also a component behaving like histamine. Further extensive work on active principle (s) is in progress.

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*Short Research Communication*

# ON STANDARDISATION OF ASAVAS—ARISHTAS—V EFFECT OF ADDING JAGGERY TO THE KASHAYA UNDER HOT AND COLD CONDITIONS

## Introduction

In earlier papers[1–4] the results of our investigations on some of the aspects of standardisation of Arishtas have been reported. In the present communication the effect of adding jaggery to the kashaya under hot and cold conditions is presented.

## Materials and Methods

Draksharishta kashaya was prepared strictly according to the Ayurvedic text as described earlier[1–2]. The kashaya was divided into 2 lots. To one batch the required quantity of jaggery was added and stirred well and heated; when the jaggery was dissolved, it was boiled for a couple of minutes. The hot liquid was poured into a glazed porcelain jar and allowed to cool to room temperature. The prakshepana Churna was then added, stirred with a sterile glass rod and kept for fermentation as usual[1–2]. In the second batch jaggery was added only when the kashaya was cooled to about 40°C; the powdered jaggery was added and dissolved with stirring. It was then transferred into the porcelain jar, the 'prakshepana churna' was added, stirred and kept for fermentation. After a period of 30 days the obtained arishtas were filtered, centrifuged at 3000 RPM for 30 minutes and subjected to chemical analysis. The analytical data of both the arishtas are given in table I.

## Results and Discussions

A perusal of the results of the analysis of the analysis of the Arishtas of both the batches reveal the drastic difference exhibited by both these batches. Specific gravity, total solids and total sugars are lesser in the cold Arishta than the hot Arishta. Cold arishta has recorded an alcohol content of 7·64% where as in the hot arishtas there is no alcohol on the day of filteration. Though the tannin content is the same in both the arishtas the cold arishta has 3 times the ether extractables as the hot arishta; this can be attributed to the presence of alcohol in the former which is a good extractant. Also the 'hot' Arishta shows a lower pH and higher titratable acidity than the 'cold' one. The result of these analysis are of much significance in the large scale preparation and in the bottling process. Though the 'hot' arishta does not show any sign of fermentation on the 30th day, it has been found that fermentation starts in the bottles after 2 or 3 days. In the hot process the yeast cells are destroyed because of higher temperature and hence does not favour a good fermentation where as in the cold process the yeast cells (from jaggery) are not destroyed and hence favour a good fermentation during the sandhana period. The onset of fermentation after filtering and bottling is due to the yeast

### TABLE I

*Analysis of Arishta*

| Sl No | | Cold | Hot |
|---|---|---|---|
| 1. | Specific gravity | 1.165 | 1.226 |
| 2. | Total Solids% | 48.20 | 62.65 |
| 3. | pH | 4.3 | 3.6 |
| 4. | Total Sugar (g/100 ml) | 38.65 | 53.50 |
| | (a) Reducing Sugar (g/100 ml) | 38.45 | 47.55 |
| | (b) Non-reducing sugar (g/100 ml) | 0.20 | 5.95 |
| 5. | Alcohol% | 7.64 | — |
| 6. | Titratable acids (ml O. IN NaOH/100 ml) | 43 ml | 112 ml |
| 7. | Volatile acids (ml O. IN NaOH/100 ml) | — | — |
| 8. | Ash (g/100 ml) | 1.10 | 1.32 |
| | (a) acid insoluble ash | traces | 0.10 |
| | (b) acid soluble ash | 1.10 | 1.22 |
| 9. | Tannins (mg/100 ml) | 540 mgs | 540 mgs |
| 10. | Ether extractable (mg/100 ml) | | |
| | Total | 220 mgs | 80 mgs |
| | Carboxylic | 83 mgs | 35 mgs |
| | Phenolic | 13 mgs | 9 mgs |
| | Basic | — | — |
| | Neutral | — | — |
| | Date of analysis | — | — |

cells contaminated from the air during filtering and bottling.

**Summary**

The effect of adding jaggery to the kashaya under hot and cold conditions is described. It has been found that addition of jaggery in the cold condition results in a better fermented arishtas of lower acidity than that, from the addition of jaggery to hot kashaya.

ACKNOWLEDGEMENT

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*December* 9, 1975
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*Jour. Res. Ind. Med. Yoga & Homoeo. 11 : 1, 1976.*

***Short Research Communication***

# ANTIFERTILITY PROPERTIES OF *HIBISCUS ROSA SINENSIS* (Leaf and Stem) AND BUTEA MONO SPERMA (Flower)

**Introduction**

Many plants have been reported to have antifertility effect in animal or human being (Chaudhury, 1966; Michel and Chaturvedi, 1969) but no systematic approach to various part of the plants has been made so far. *Hibiscus rosa sinensis* and *Butea monosperma* are the two drugs which are also in the list of antifertility agents with some controversial statements. In Kerala local woman as well as Ayurvedic physicians have been reported to use *Hibiscus rosa sinensis* flower as antifertility measures. Author in this communication reports the pharmacological findings of leaves and stem along with branches of *Hibiscus rosa sinensis* and *Butea monosperma* flower. Present study is in continuation of a large programme to screen antifertility drugs as mentioned in Ayurvedic literature.

**Materials and Methods**

The green leaves, stem along with branches and flowers used were collected from Varanasi district 100 gms each of the dried, powdered sample was extracted with rectified spirit and benzene separately. Both soxhlate and cold percolation methods were used. Extracts were taken in 1 litre flask fitted with vacuum distillation apparatus and solvent was removed at reduced pressure. The residual syrupy mass was taken in sterile ground nut oil or propylene glucol+water separately and given to animals orally in the desired dose (Table 2).

All the extracts were administered orally by intragastric rubber catheter tube in desired dose and duration. The albino rats used were purchased from the regular suppliers of Surgical Research Laboratory, Institute of Medical Sciences, B.H.U. weighing between 100 to 130 gm. and maintained under uniform environment. Standard laboratory diet (S.R.L.) and tap water were supplied adlib.

The post-coital antifertility activity of the extracts were screened by the method described by Khanna and Chaudhury (1968),

Vaginal smear of adult fertile female rats in oestrus cohibiting with males were taken. The day when sperms were found in the smear was considered as D–1 of pregnancy. The flower extract was administered through a rubber catheter tube from D–1 to D–10 of pregnancy. Laparotomy was performed on D-11 of pregnancy and number of implantation sites in uterus were counted. On the day 21 and 22 litters delivered were noted.

**Result**

The results obtained after administration of various extracts of the different parts of the plant are given in the table. Though flower of the *H. rosa sinensis* has been reported to have antifertility effect but leaves as well as stem with branches do not possess such effect.

TABLE I

*Constituents and Concentration of Various Extracts*

| S.N. | Plant and the Parts | Extract | Concentration | Feeding Vehicle |
|---|---|---|---|---|
| 1. | Hibiscus Rosa Sinensis Leaves | 1. Rect. spirit | 125 mgm | P.G. + Water |
| | | 2. Benzene | 125 mgm | Ground nut oil. |
| 2. | Hibiscus Rosa Sinensis Stem | 1. Rect. Spirit | 125 mgm | P.G. + Water |
| | | 2. Benzene | 125 mgm | Ground nut oil. |
| 3. | Butea mono sperma flower | 1. Rect. spirit | 100 mgm | P.G. + Water |
| | | 2. Benzene | 100 mgm | Ground nut oil. |

P.G. = Propylene glycol.

TABLE 2

| | Name of the plant and part | Solvent of Extraction | Dose | No. of rars used | No. of plants implanted on 11th day | Implantation sites in individual rats | Percentage A. F. |
|---|---|---|---|---|---|---|---|
| 1. | Hibiscus Rosa Sinensis Leaves | 1. Rect. spirit | 250mgm | 5 | 5 | 10,5,8,9,4 | Nil |
| | | 2. Benzene | 250mgm | 5 | 5 | 0,3,6,9,11 | 20% |
| 2. | Hibiscus Rosa Sinensis Stem | 1. Rect. spirit | 250mgm | 6 | 5 | 0,9,7,5,12,8 | 17% |
| | | 2. Benzene | 250mgm | 5 | 5 | 2,14,6,9,8 | Nil |
| 3. | Butea monosperma flower | 1. Rect. spirit | 200mgm | 5 | 4 | 0,13,9,6,5 | 20% |

Note : A. F. = Antifertility

**Discussion**

The percentage of rats conceiving after one successful matings in animal colony is 95%. The Benzene and rectified spirit extractives of all the drug did not show any appreciable reduction in implantation. *Hibiscus rosa sinensis* leaves and stem alongwith branches do not possess the activity to the extent of flower and hence it appears that active ingradient is only in the flower and not in the other parts.

## ACKNOWLEDGEMENT

Author is thankful to the Director, C.C.R. I.M,H, for financial help.

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*November 25, 1975*

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*Short Research Communication*

# AYURVEDIC TREATMENT IN RESISTANT PSEUDOMONAS URINARY TRACT INFECTION

(Case Report)

A 35 years female reported from Mangalore Town (Dist. Saharapur), with vague urinary complaints, to the Central Research Institute for Ayurveda, Patiala, in May, 1972. The history of the patient dated back to a year back when she was operated for fibroid uterus and there was operative trauma to one of the ureters which was later repaired. Following this episode, since then, the patient was getting recurrent persistant urinary tract infection.

After her reporting to the Institute, the urine was examined and it showed Pus cells +++ and the culture of urine on MacConkey's and Blood Agar medium after 36 hours of inoculation at 37°C showed growth of Pseudomonas Pyocyaneous infection.

According to Ayurveda, we may say that it was the case of 'Gavini Vranapaka' as Acharya Sushruta describes:

> वातादृते नास्तिरुजा न पाक: पित्तादृते नास्ति
> कफाच्च पूय: ।
>
> (सुश्रुत)

Although, in the beginning, 'Vranarohana' (healing of the wound) from outside was completed but some signs of 'Pootipooya' were still remaining with the 'Vrana Vastu'.

**Treatment**

The patient was put on the following set of Ayurvedic medicine :—

Kaishore Guggul
2 tabl. Q. I. D.
Jatiyadi Ghrit
1 gm. B. D.

FOR
A TOTAL PERIOD OR
THREE MONTHS

**Results**

The urine became sterile in about 15 days treatment and pus cells reduced to ++ which were fully controlled in about two months treatment. The treatment was continued for a total of three months.

**Discussion**

Pseudomonas urinary tract infection is not very common. Once it occurs its treatment is very troublesome. This patient had been on Aerosporin (Polymyxin B sulphate) prior to reporting to this Institute but response to urinary tract infection was not satisactory as was evident from the various previous urinary examination reports. Urinary tract infection in general, irrespective of the causative organisms are usually troublesome and their treatment is a problem all the world over. Response to the uncommon pseudomonas urinary tract infection by the above set of Ayurvedic medicines is, therefore, worth reporting.

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2. We are very grateful to Professor H. E. de Wardener, author of 'The Kidney', Department of Medicine, Charing Cross Hospital Medical School, Fulham Hospital, London W 6, for discussing the varied aspects of this case.

*November 26, 1975*
*(Central Research Institute for Ayurveda, Patiala)*

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Ajit S. Puri

*Short Research Communication*

# AYURVEDIC TREATMENT OF POLYCYTHAEMIA

## (Case Report)

Shri Des Raj, a middle aged male, developed an episode of Coronary Artery Insufficiency in October, 1972. On investigation his Haemoglobin came to be 20 G% R. B. C. Count 7.5 millions per cu mm., P. C. V. 55%, W. B. C. count 55,000, E. S. R. 2 mm., Blood Uric Acid 7 mgms%, Platelet count 1,75,000 cu mm., Peripheral blood film showed no immature series of cells. With this data, he was diagnosed as a case of Polycythaemia. His further investigations showed moderate albuminuria, serum creatinine 1.7 mgms%, red cell volume 31.5 ml/kgm (normal 28-32 ml/kgm), plasma volume 37. 6 ml/kgm (normal 35.60 ml/kgm), total blood volume 69.1 ml/kgm (normal 60-80 ml-kgm), venous haematocrit 50%, whole body haematocrit 43.8%.

Although the diagnosis of Polycythaemia was undoubted in this case but its cause and treatment created problems. On careful history the patient revealed that in 1967 he was diagnosed as a case of solitary congenitial cyst in one of his kidneys and we concluded that present polycythaemia may be due to this solitary congenitial cyst and this conclusion was further approved by Dr. M. M, Wintrobe, M. D., author of the Text Book of Haematology, University of Utah, U. S. A. to whom the detailed discussion of the case were sent.

The patient actually reported to the Institute when he was exhausted with all the allopathic measures which he tried from October, 1972 to December, 1972 and the level of Hb. and PCV did not fall significantly.

### AYURVEDIC REVIEW

The word blood of modern medicine is meant for the combination of Rasa and Rakta dhatu of Ayurveda. In many recently published books of modern Ayurvedic writers 'Rakta' is compared with the Red blood corpuscles. As we see in the cases of Raktapitta.

तस्योष्मणा द्रवो धातुर्धातोर्धातोः प्रसिच्यते ।
स्विद्यतस्तेन संवृद्धि भूयस्तदधिगच्छति ।।
(चरक० चि० ४)

The drava dhatu of rakta increases in its volume similarly in Panduroga is also an important disease produced by the pitta dosha and rakta dhatu. In the later we find that the rasa dhatu decreases and rakta dhatu too becomes affected due to excessive heat of pitta. Where the patient of 'Pandu' takes too much eatables which increases pitta dosha results in producing Haleemake-Hareedraka and others. Drawing a picture of such case Acharya Charaka says.

स रक्ताक्षिमुखच्छर्दिर्विण्मूत्रो यश्च ताम्यति ।
दाहारुचितृषानाहतन्द्रामोह समन्वितः ।।
(च० चि० १६)

There is no need in eleborating it further. We may say that it is a disease occured by some defect in the rasadhatu and rakta dhatu paka. The use of Punarnava improves liver cells and Gokshuru helps in improving the activities of kidney. Both are the important organs with relation to Raktavaha Srotasa. Amalaki is always prescribed for all sort of ailments of Rasavaha srotas.

## TREATMENT

The patient was put on the following set of Ayurvedic medicines :—

| | |
|---|---|
| Gokshuru<br>Varuna<br>Amalaki<br>Punarnava | in equal quantity<br>(to be used in decoction form)<br>20ml. B.D. |

### Results

It is worth reporting that in about 15 days treatment the level of Hb., P. C. V. and other related investigations touched normal. The treatment was continued for total three months, and the patient till now is normal and fit. Failure of the allopathic treatment and dramatic response with Ayurvedic therapy prompted us to report this case of Polycythaemia which is not a very common condition.

## ACKNOWLEDGEMENT

1. The authors are grateful to the Central Council for Research in Indian Medicine and Homoeopathy, New Delhi under whose auspicious the Central Research Institute for Ayurveda is established.
2. The authors are also grateful to Dr. M. M. Wintrobe, author of the text book of Haematology, University of Utah for going the details discussion of the case and the guidance thereof.

*November 26, 1975*

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*Short Research Communication*

# CHEMICAL EXAMINATION OF MUDGAPARNI (*PHASEOLUS TRILOBUS* AIT)

**Introduction**

Mudgaparni identified as *Phaseolus trilobus* Ait. (Family-Leguminosae) is a trilobed variety of *P. roxburghii*. The plant is quite common in Bengal and Deccan. The leaves are sedative and tonic. They are applied to the eyes to improve eyesight and also in ophthalmias, and haemorrhoids and is also used as a febrifuge (Chopra *et at,* 1956).

Chemical examination of the plant has yielded a mixture of bases in minor amounts and three crystalline compounds viz., friedelin, epi-friedelinol and stigmasterol.

## EXPERIMENTAL

Coarsely ground *P. trilobus* (2.5 kg) was extracted exhaustively by cold percolation with hexane, chloroform and alcohol successively. The total hexane extract (6 gm), after removal of the solvent was taken up in ether and treated with dilute hydrochloric acid (0. 4 N). The base obtained after usual work-up was too little for further characterisation. TLC showed it to be a mixture of atleast two compounds.

## ISOLATION OF TRITERPENES

Hexane extract, after the removal of the besic matter was chromatographed over silica gel (120 gms). Hexane-benzene mixture (20%) eluates afforded a waxy material which on washing with hexane gave a crystalline solid. It was repeatedly passed through silica gel and recrystallised from hexane-benzene mixture (1 : 1) (200 mg) m. p. 260°. It gave purple colour with tin and thionyl chloride. It was found identical (TLC, m. p. and mixed m. p.) with an authentic sample of friedelin.

Further elution of the column with benzene gave fractions which showed two spots on TLC. (benzene). The mixture was passed through alumina and two compounds B and C were separated. Compound B was crystallised from hexane-benzene mixture (150 mg) m·p. 280°. It gave a positive triterpene test. Compound C was a low-melting solid m.p. 86-87°, which was not further examined.

## ACETYLATION OF COMPOUND B

A mixture of compound B (100 mg), pyridine and 3 ml of acetic anhydride was kept overnight. The product after usual work-up was crystallised from methanol m. p. 285° and was compared with an authentic specimen of epi-friedelinol acetate and found to be identical. (m. p. and mixed m.p.)

The chloroform eluates of the column (hexane extract) yielded a steroid (300 mg). It was crystallised from methanol, m. p. 170°, $[\alpha]_D$-51° ($CHCl_3$). Acetate, m. p. 144°, identical with stigmasterol and its acetate (TLC, m. p. and mixed m. p. with an authentic sample).

**Summary**

The hexane and chloroform extracts of the plant *Phaseolus trilobus* Ait. were found to contain the triterpenes, friedelin, epi-friedelinol and the steroid stigmasterol.

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*Short Research Communication*

# OCCURRENCE OF NEOTIGOGENIN AND HECOGENIN IN *TRIBULUS TERRESTRIS* LINN

The entire plant of *Gokshura,* botanically identified as *Tribulus terrestris* Linn. (Fam. Zygophyllaceae), is one of the most important ingredients of *dasmoola* and hence frequently ed in Indian systems of medicine (Chopra *al.,* 1958). The drug is diuretic, tonic, aphro-isiac and often used in painful micturition. The reshly expressed juice of the aqueous extract of the whole plant contains inorganic nitrites, mostly potassium nitrite in toxic amounts (Mukherjee, 1953).

Earlier investigations of this plant yielded a number of steroid sapogenins viz., chlorogenin, gitogenin, diosgenin and ruscogenin respectively (Enslin and Wells, 1956). In the present communication we wish to report the isolation of two steroid sapogenins, hecogenin (3β–hydroxy–5α –spirostan 12–one) and neotigogenin (5α : 22α : 25S-spirostan–3β–ol) from the whole plant of *T. terrestris*. The occurrence of these two compounds in this plant, has not been encountered earlier.

The chloroform extract of the whole plant of *T. terrestris* upon chromatography over silica gel yielded two compounds, viz. Compound A and Compound B in crystalline forms.

Compound A, $C_{27}H_{44}O_3$*, m. p. 199–201°, ($M^+416$), $(\alpha)_D -63°$ ($CHCl_3$) contains a OH group ($\nu_{max}$3500 $cm^{-1}$). It easily forms a monoacetate $C_{27}H_{46}O_4$, m. p. 170° ($\nu_{max}$1725 and 1240 $cm^{-1}$).

In its NMR spectrum, compound A exhibits signals for four C–methyls of which two are secondary (δ1.02 and 0.90, 3H, d, each). Two tertiary C–methyls appear at δ0.32 and 1.12 (3H, s, each) respectively. A multiplet at δ3.58 integrating for one proton has been assigned to the 3α axial proton of C–3 to which a β–CH group is attached.

The spectrum also discloses the presence of an AB quartet for two protons around δ3.98 (J=12Hz). (C–26).

These spectral characteristics are strikingly similar to those observed for a steroid sapogenin with a $C_{27}$ framework in which the side chain contains an oxide bridge linked at C–22 in a spiroketal group.

The physical constants and the spectral characteristics (IR & NMR) of compound A, and its acetate are identical to those reported for neotegogenin (25S–5α : 22α spirostan-3β-O1) (I) and its acetate respectively.

Compound B, $C_{27}H_{42}O_4$, $M^+430$, m. p. 243°, $(\alpha)^{20}_{D} + 10°$ (chloroform), contains an hydroxyl group (3460 $cm^{-1}$) and a six membered ring ketone (1710 $cm^{-1}$). It readily forms a monoacetate, $C_{27}H_{49}O_5$, m, p. 240° which lacks hydroxyl absorption in the IR spectrum, but shows bands, at 1710 cm$^{-1}$ (cyclohexanone), 1725 and 1245 cm$^{-1}$ (acetate) respectively. The compound also forms a semicarbazone berivative, m. p. 195°. The NMR spectrum of the compound B was essentially similar to those reported for a 3$\beta$ hydroxy spirostanone derivative. The physical contants and the spectral characteristics of the compound B and its acetate are similar to those reported for hecogenin (3$\beta$–hydroxy 5$\alpha$–spirostan–12–one) (II). However, the identities of compound A and compound B are finally established as neotigogenin and hecogenin respectively on the basis of their mass spectral fragmentation patterns.

---

* Satisfactory analysis were obtained for all the compounds.

Both the compounds show the fragmentation products of m/e 139 (a) and m/e 115 (b) which are commonly recognised as those resulting from the spiroketal ring system F. (Chart–1).

The other ion peaks *c, d, e, f, g* and *h* comprise an intact steroid nucleus and result from transition states involving cleavage of any of C–C and C–O bonds attached to C–22. These are well represented by the mass spectra of neotigoenin and hecogenin. (Table I).

TABLE 1

| Compound | ion species | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | a | b | c | d | e | f | g | h |
| Neotigogenin | 139 | 115 | 273 | 302 | 287 | 344 | 347 | 357 |
| Hecogenin | 139 | 115 | 287 | 316 | 301 | 358 | 361 | 371 |

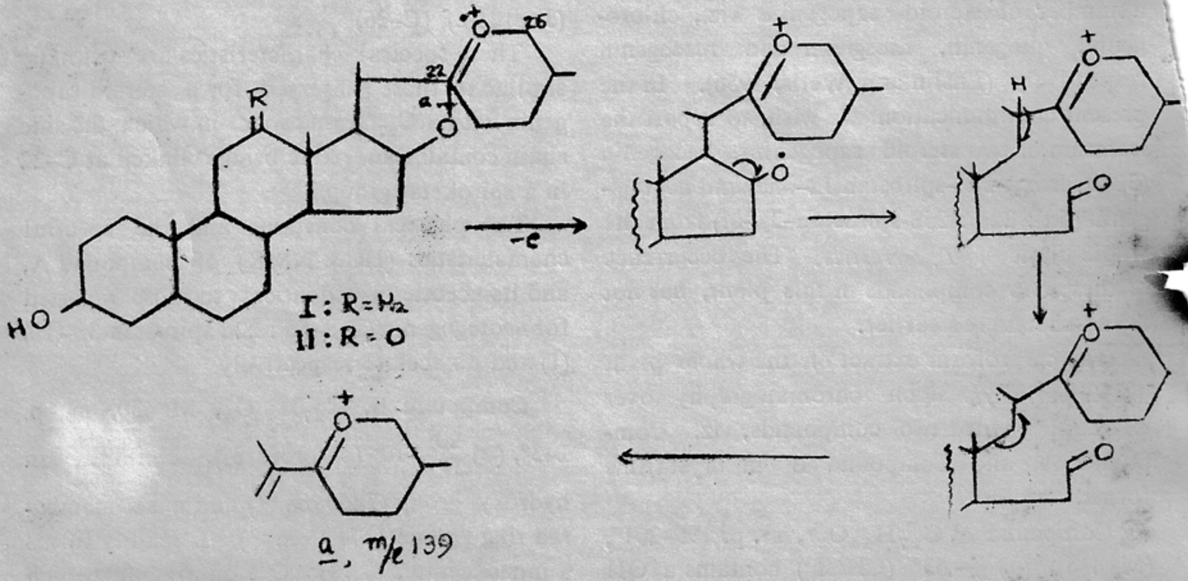

CHART 1

The ions *f* and *h* involve an α–cleavage or fission of C–O bond at C–22 resulting in the formation of peaks at m/e 344 (358), 357 (371) respectively. The cleavage of C–C bond at C–22 gives rise to ion *g* at m/e 347 (361). The figures im the parenthesis represent m/e values for hecogenin (II, R=O). The fragmentation patterns are represented in chart 2.

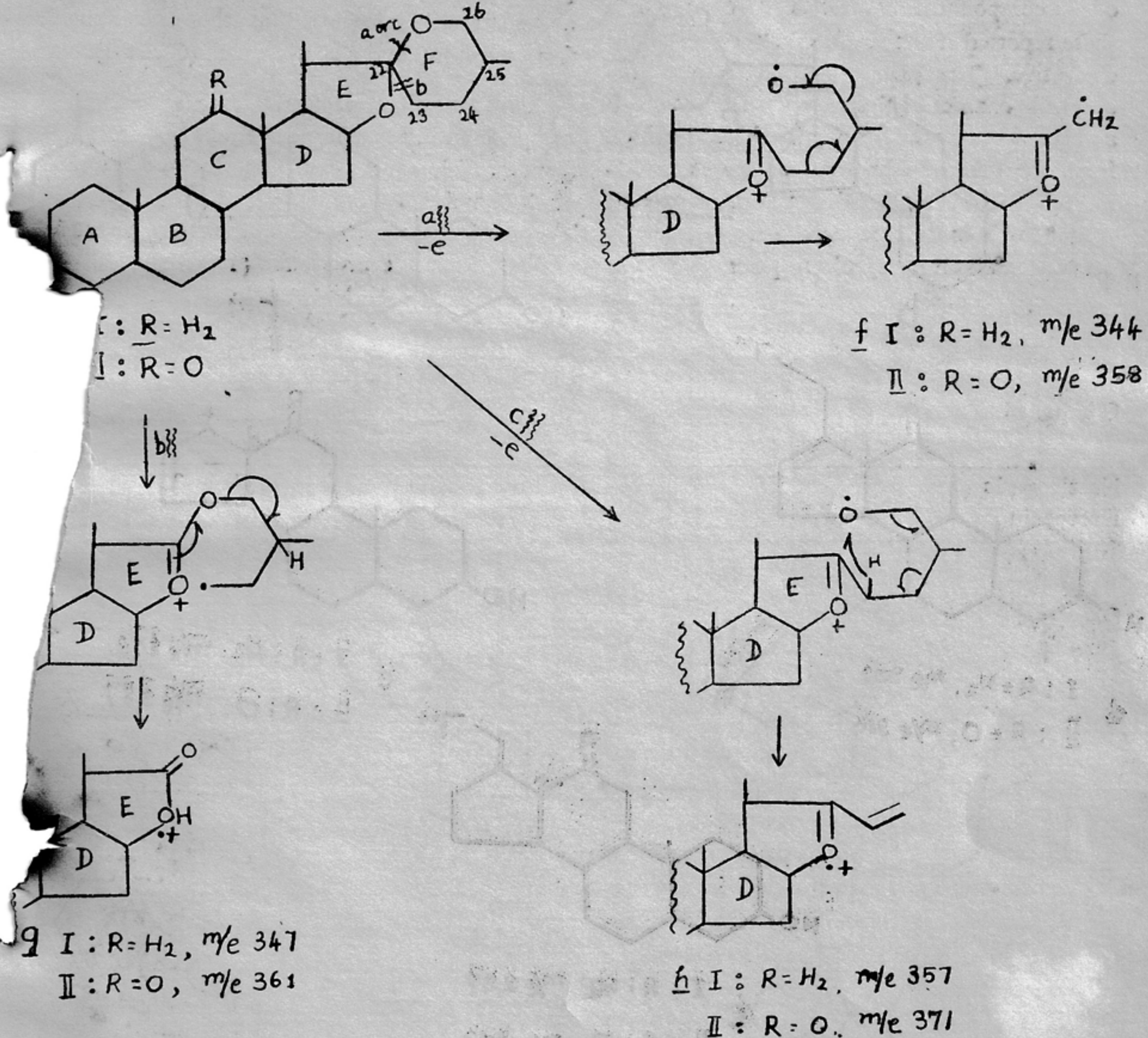
a or c
26
F
25
R
E
22
b
23
24
O
C
D
A
B
: R = H2
I : R = O
a
-e
D
O
CH2
O
D
f I : R = H2, m/e 344
II : R = O, m/e 358
b
c
-e
O
E
O
H
D
O
E
H
O
D
E
OH
D
g I : R = H2, m/e 347
II : R = O, m/e 361
O
D
h I : R = H2, m/e 357
II : R = O, m/e 371

CHART 2

The ions *c, d,* and *e* are formed by the fragmentation of ring E. The fragmentation pattern is described in the sequel (Chart 3) to give ionic species at m/e 273 (287), 302 (316) and 287 (301). The values in the parenthesis represent the ionic species for hecogenin. (II, R = O) Chart 3

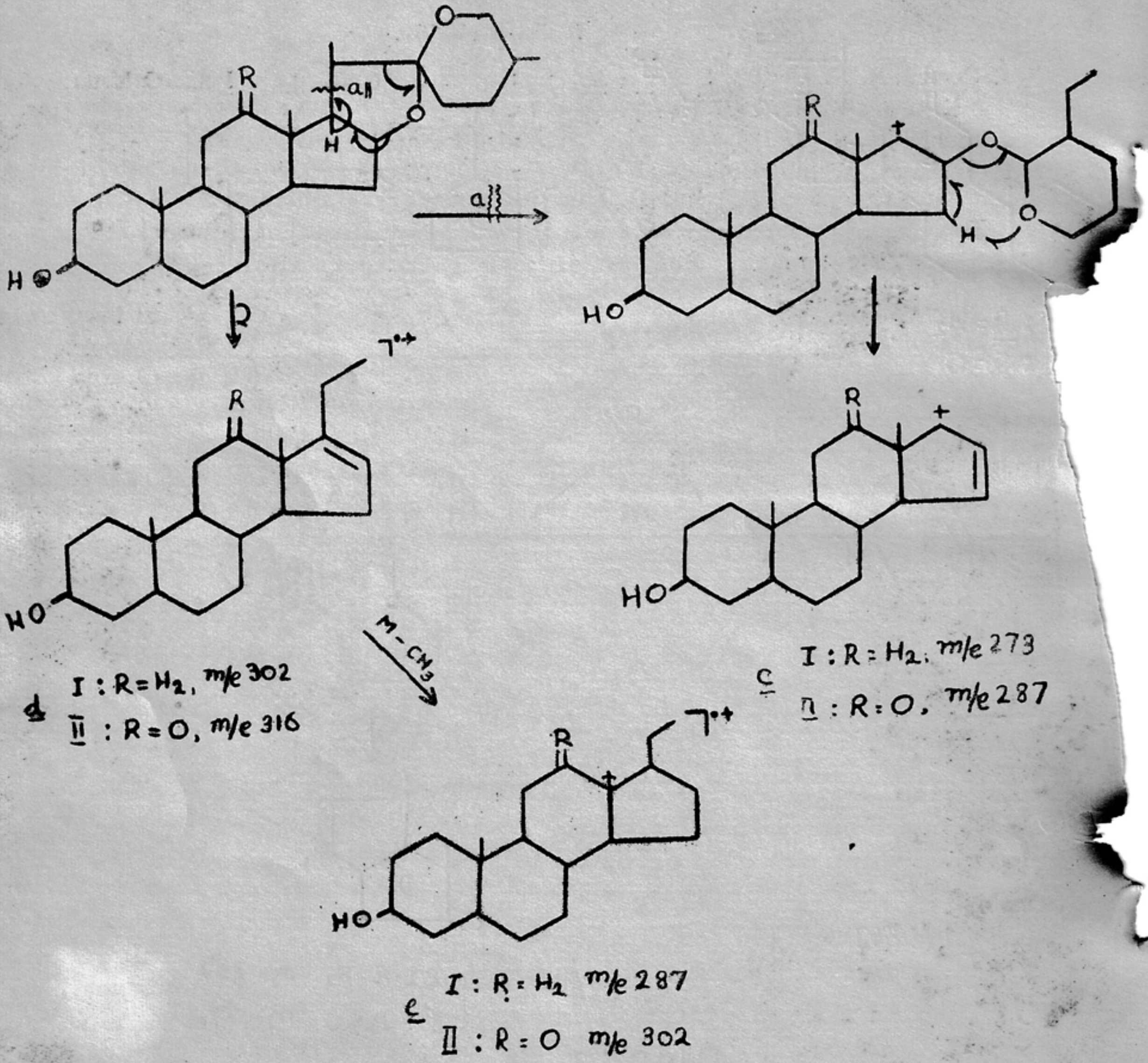
R
a
H
HO
a
b
R
+
H
HO
R
HO
d
I : R = H₂, m/e 302
II : R = O, m/e 316
M - CH₃
R
+
HO
c
I : R = H₂, m/e 273
II : R = O, m/e 287
R
+
HO
e
I : R = H₂ m/e 287
II : R = O m/e 302

CHART 3

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*Short Resarche Communication*

# CHEMICAL STUDIES ON *GUAZUMA TOMENTOSA* LEAVES

*Guazuma tomentosa* Kunth (syn. *Guazuma ulmifolia* Lam) (Fam. : *Sterculiaceae*) is widely distributed in Southern parts of India. Fruit is used as a pectoral in cases of bronchitis. reasted seeds are astringent, and are used in stomach troubles. The bark is valued for elephantiatis; old bark is useful in cutaneous and chest diseases. Leaves extract reduces corpulence. The fruits when eaten in exces quantity causes diarrhorea (C. S. I. R., 1956).s

Quercetin, Kampferol and Kaempferitin have been reported from flowers (Subramanian, 1963). The presence of taraxerol and sitosterol in the leaves has been reported (Pandey, 1975). The present communication deals with eht other neutral constituents present in the leaves.

Dried and powdered leaves of *Guazuma teomentosa* were extracted with pet. ether (60–80°) in a soxhlet extractor. The solvent was removed and chromatographed over-alumina column eluting with different solvents of increasing polarity. All the eluants were tested for their homogeneity over silica gel G chromatoplates. Fractions eluted with pet. ether (60–80°) furnished a solid, which crystallised from petrol as needles, m. p. 289-90° (0.006% in terms of crude drug); T. L. C. : Rf. 0.84 (pet. ether-benzene, 1 : 2; Liebermann-Burchard reagent→pink on heating). I. R. shows the presence of an ester carbonyl group at 1730 cm$^{-1}$. N. M. R. in $CDCl_3$ was found to be identical with reported for taraxero acetate. It was hydrolysed with IN NaOH. The hydrolysed product on crystallisation from petrol (60–80°) yielded fine needles, m.p. 272–73°; benzoate, m.p. 280–81° (benzoyl chloride-triethylamine), and was identified as taraxerol by direct comparision (m.p., mixed m.p., co–T. L. C. and superimposable I.R.) with authentic specimen. The parent compound was therefore identified as taraxerol acetate.

Pet. ether ( 1 : 1) eluates were mixed and crystallised from absolute alcohol to yield taraxerol, m.p. 273–74° (0.001%) Pandey, 1975). The mother liquor left after separation of taraxerol was evaporated to dryness and crystallisation from ethylacetate afforded colorless granules (0.011%), m.p. 84°; T. L. C. Rf 0.38 (pet. ether–benzene, 1 : 2; $I_2$ as developer). Found : C, 81.68%; H, 13.77%. Caled. for $C_{28}H_{58}O$ : C, 81.87%; H, 14.23%. I. R. (nujol) $\delta$ max 3300 cm$^{-1}$ (–OH). N. M. R. ($CCl_4$), a sharp sinlet at $\delta$ 1.28 due to poly-methylenes. On acetylation with acetic anhydride and pyridine at room temparature, it yielded an acetate m.p. 76° N. M. R. ($CCl_4$) shows the presence of a acetyl group at $\delta$ 2.1 as singlet and a singlet at $\delta$ 1.28 due to poly-methylenes. The physice-chemical properties of the compound indicated it to be octacosanol, identity with which was confirmed by direct comparision (m.p, mixed m.p. land co–T. L. C.) with authentic sample.

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*Short Research Communication*

# BOTANICAL IDENTITY OF "HALUN"

In the literature, several indigenous crude drugs have been mentioned under the vernacular names of Halun, Halyun, Halgun, Halim and Haleem.

The following table gives the botanical names of the above drugs as mentioned in the literature.

As the drug is quite important in the indigenous system of medicine and is used for the treatment of various ailments, it was considered worthwhile to establish theb otanical identity of the drug which is available under the name of "Halun" in the local market.

The samples of the drug were procured from M/s Hamdard Dawakhana, Delhi and from several other local shops of the capital dealing in the crude drugs. All the samples were found to be identical in all respects.

The drug consisted of yellowish-brown to dark-brown seeds which were oblong ovate with slightly concave ventral surface, 2.4-3.0 mm. long and 1-1. 8 mm. wide at the middle. At the narrow end of the seeds there was a longitudinal ridge with a saddle-shaped hilum.

The pods, 5 mm. long and 3 mm. wide, greyish-white in colour were orbicularovate, deeply notched and thickly winged above. They contained two seeds and opened into two valves. The Pharmacognostical data of the seeds compared well with those of the seeds of *Lepidium sativum* Linn[6].

The final identity of the seeds as *L. sativum* Linn. was established by cultivating the drug in a small plot in the campus of the Institute. Sowing was done in the month of October, 1974, the plants flowered in January/February 1975, and the crop was harvested in March/April. The plant agreed well in all respects with the herbarium specimen of *Lepidium sativum* Linn., which was made available through the courtesy of the Delhi University.

The authors are grateful to Hakim Abdul Hamid Sahib, President of the Institute of History of Medicine and Medical Research for providing facilities and for his keen interest throughout this work. Thanks are also due to Dr. K. M. M. Dakshini of the Botany Department of the Delhi University for his help in the identification of the drug.

TABLE

| S. No. | Vernacular Name | Botanical Name |
|---|---|---|
| 1. | Halun[1] | *Solanum gracilipes Dcne* (Solanaceae) |
| 2. | Halim[1,2,4,5] & Haleem[3] | *Lepidium sativum Linn* (Cruciferae) |
| 3. | Halyan, Halyun & Halgun[1,4,5] | *Asparagus officinalis Linn* (Liliaceae) |

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*Short Research Communication*

# PENTABOTHRA NANA HOOK. F.—A NEW RECORD TO THE FLORA OF MADHYA PRADESH.

## Introduction

A perusal of botanical literature on the floristic studies carried out by different workers [e.g. Panigrahi *et al* (1965-69), Kaushik (1969), Bhatnagar, Singh & Pandey (1973), Singh *et al.* (1974) in press, etc]. indicate that *Pentabothra nana* Hook.f., a monotypic endemic species of the family Asclepiadaceae, has not been recorded from Madhya Pradesh so far. Therefore, it is worthwhile to record this interesting and rare species which has a very restricted distribution both for India and world as well.

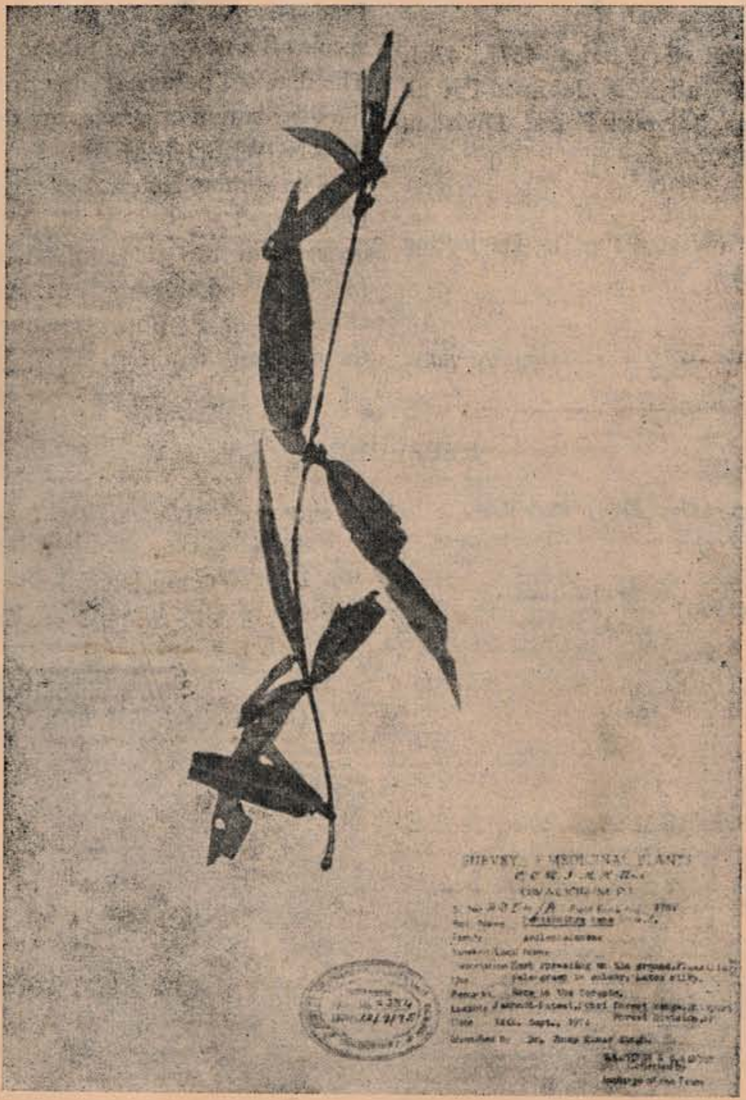
## Observations

*Pentabothra nana* (Buch.–Ham ex Wt.) Hook.f. in Hooker's Ic.Pl. 15:21 t. 1426-1883 & Fl. Brit. Ind. 4:19. 1883; Fl. Upper Gang. Plain Vol. 1:499, 1960; Debika (Nee Das) Mitra and Bhabish Roy in Bull. bot. surv. India Vol. 13 (1 & 2), 1971. *Cynanchum nanum* Buch. Ham. (ex. Wall. Cat. No. 8230. 1847 nom. nud.) ex wt. Contrib. 59. 1834. T: India, Assam, Kamrup, Sannyahikate Hamilton 765 (K).

Herb spreading; *Leaves* subsessile, linear 5-10 x 0.4-2 cm. long cordate at the base, sharply acute at the apex, dark green above light grey below, midrib raised and prominent beneath, lateral nerves 8-12 pairs. *Inflorescence* axillary and terminal, cymose umbels 1.3-2 cm. across; peduncle stout, 2.5 to 5 mm. long, bracts linear-subulate, glabrous; pedicels slender, terete, 3-5 mm. long glabrous or sparingly hairy *Calyx* 5-partite to the base, segments 4 x 1.4 mm., lanceolateoblong, broadly scarious margined, ciliate with upcurved hairs, glabrous within. *Corolla* greenish yellow outside, 5-partite near to the base, segments 6-7 x 3.5-4 mm., broadly oblong, obtuse-rounded, imbricating, fleshy, adnate to the corona at base. *Corona* 6-7 mm. long, single ± 3 mm. long scales which are adnate to the filaments, and of 5 pouch-like folds at base of the column alternating with the anthers; anthers 5 with round incurved memberanous appendages; translators inverted Y-shaped, corpusculum minute, dark brown, retinacula minute, pollinia solitary in each cell. Ovary 2-carpelled; stigma 5-gonal, disk small.

Rare in the undergrowth of forests. The greenish-yellow flowers in the axil of leaves are conspicuous and provide a useful clue for easy identification of the species in the field (see Plate). The species tends to attain twining habit and reaches upto 1 m., if allowed to grow with a support.

In the field the plant may be mistaken for *Ichnocarous frutescens* R. Br. (known as Kali Sariva) with which it resembles most in general appearence, while making raw drug collection. There is no report of medicinal utility of the species in the area explored, nor the literature on medicinal plants mention about its medicinal uses.



*Flowers :* September

*Herbarium specimens examined*

V. K. Singh and G. Pandey 4577, 4781, Nakta Pathar Ki Taliya & Jokhnod-Patvai, Pohri Forest Range, Shivpuri Forest Division, M. P.; 9.9.74 & 14.9.74.

*Distribution*

India: Assam (West Bengal). Darjeeling and Pilibhit (U.P.).

**Summary**

The present note records *Pentabothra nana* Hook. f. for the first time from Madhya Pradesh. As far as authors are aware the species is a new record to the flora of state;. The detailed botanical description, alongwith the distribution of species are dealt with.

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